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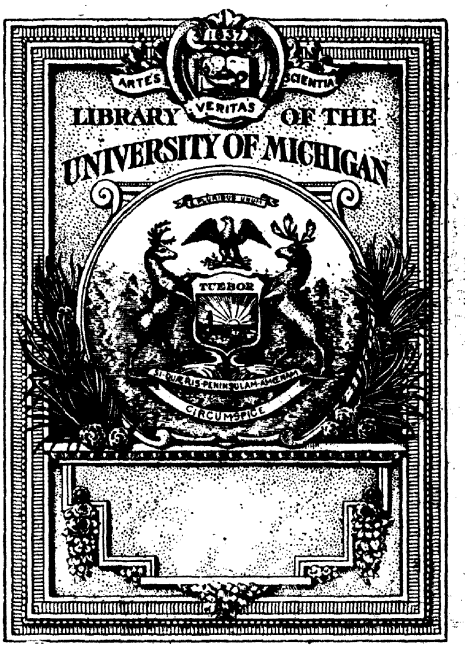

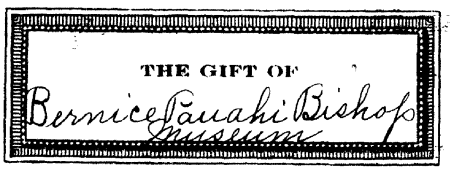

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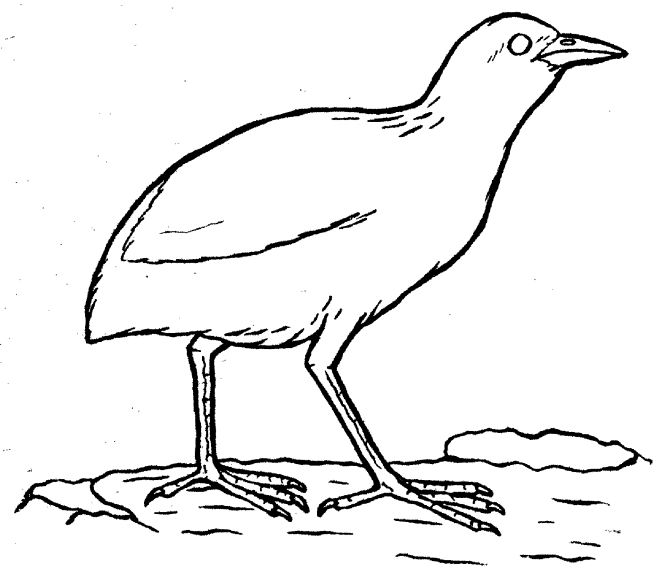
A

KEY

TO THE

BIRDS OF THE HAWAIIAN GROUP.



BY WILLIAM ALANSON BRYAN,

CURATOR OF ORNITHOLOGY IN THE MUSEUM.

HONOLULU, H. I.:
BISHOP MUSEUM PRESS.
1901.

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FOREWORD.

THE following preliminary key to the birds of the Hawaiian possessions is based on a study of the collection of birds in the Bernice Pauahi Bishop Museum, which institution now possesses the most representative collection of the Hawaiian avifauna extant. The collection at this time numbers upwards of six hundred specimens, embracing the famous Mills collection, a series of skins collected by Mr. Palmer for the Rothschild museum, a valuable collection made by Mr. R. C. L. Perkins, together with collections by Messrs. W. H. Hall, F. Gay, A. F. Judd, and others. To the above collection almost daily additions are now being made through the efforts of the Museum's skilled collector, Mr. A. Seale.

By the Hawaiian possessions it is intended to include all of the chain composed of some twenty or more islands lying in the central North Pacific ocean, stretching over an area extending from about 150° West Longitude to 175° East Longitude, and from 18° to 30° North Latitude.

Though following the scheme usually adopted by systematic zoologists in the making of analytical keys there is some slight difference in the arrangement of the text. Since it may be necessary for persons not entirely familiar with keys to make use of the following pages, it might be well to say that the fundamental characters are used for the separation and identification of species instead of lengthy and oftentimes misleading detailed descriptions. To facilitate this, dichotomous antithesis is strictly adhered to, so that there are but two alternatives; the specimen must conform to the characters given, for example, under **a,** or the whole matter under **a,**—that is, the sub-heads **b, bb, c, cc,** etc., (if there are any) must be passed over until **aa** is arrived at, which is of equal value with and the only alternative of the division **a.** If it is settled that the specimen corresponds with the characters given under **aa,** the next step is to settle between the heads **b** and **bb,** then pass to **c** and **cc,** and so on, taking up the characters in their natural order until finally the reference page is given, where the key will be found continued. Thus the key to the higher orders will be found on the last pages of the Memoir, and will indicate the order to which the bird belongs and the page where the order is treated. Similarly the order will be broken up into families, the families into genera, and lastly the genera into species. The index letters are in bold type, and characters of equal value are placed immediately under each other, while the minor divisions are indented farther and farther to the right. Hence **bb** is found set in an equal distance from the left-hand margin as **b; cc** is still farther indented, but the same distance as **c,** while the body of the text extends the full distance across the page.

The measurements are, for the most part, taken from specimens in the Bishop Museum, and are given in English inches and hundredths. The length of the wing is measured from the bend (*i. e.*, the carpal joint) to the tip of the longest primary. The length of the tail is from the apparent base to the tip of longest feather. The length of the culmen is the distance from the base of the upper mandible on top to the tip of the same in a straight line. This measurement, as well as all of the more exact ones, are best taken with the dividers. The depth of the bill is a vertical line from

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the base of the upper mandible through both mandibles. The length of the tarsus is measured from the enlargement on the front outside of the tibio-tarsal (*i. e.*, the "knee") joint to the more or less obvious beginning of the middle toe. The middle toe is measured in a straight line along the top from the last-mentioned point to the tip of the nail.

In bringing together the key I have made free and frequent use of the catalogue of birds in the British Museum, and Ridgway's Manual of North American Birds, together with the valuable contributions to our knowledge of the Hawaiian ornithology—Aves Hawaiiensis, by Messrs. Wilson and Evans, and Avifauna of Laysan, etc. I have also had at hand the published notes of Messrs. Gadow, Dole, Perkins, Stejneger, and others. In addition to the above I have had the pleasure of examining the material in the National Museum at Washington, D. C., the Philadelphia Academy of Science, the British Museum, Tring Museum, and the Jardin des Plantes. To all of these sources of information I would make grateful acknowledgement of the service they have rendered.

WM. ALANSON BRYAN.

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BIRDS OF THE HAWAIIAN GROUP.

Order LONGIPENNES.—Long-winged Swimmers.[1]

Families.

With the lower mandible not longer than the upper one and only moderately compressed, while the covering of the upper mandible is made up of one solid piece (*i. e.*, with the seams fused together, no "nail" at the tip, etc.), through which the nostrils are pierced.

FAMILY **LAR'IDÆ**.—GULLS AND TERNS.

Genera.

a. Bill rather short, and deeper at the angle than at the nasal openings; the upper mandible longer and bent down over the lower one; tail usually even (Sub-family *Larinæ*); tarsus not roughened nor serrate behind; hind toe moderately well developed; culmen more than two-thirds the length of tarsus; nostrils linear or linear ovate..... (Page 6.) **Larus.**

aa. Bill slender with both mandibles about equal in length; tail slightly or decidedly forked; angle of the lower mandible not prominent. (Sub-family *Sterninæ*.)

b. Tail more or less deeply forked; head without plumes at the gape; tarsus shorter than the middle toe and claw; outer tail feathers the longest, and pointed; tail generally more than half the length of the wing; bill compressed and slender; tarsus never exceeding and generally shorter than the middle toe and claw; depth of bill at base less than one-third the exposed culmen.....(Page 7.) **Sterna.**

bb. Tail graduated, pointed; outer pair shorter than the next pair; middle toe shorter than the exposed culmen; distance from the angle of the gonys to the tip of the bill less than to the gape.

c. Tail feathers not all pure white.

d. Fourth pair of tail feathers from the outside the longest; wing more than 9.50.....(Page 9.) **An'oüs.**

dd. Third pair of tail feathers from the outside the longest; wing less than 9.50.....(Page 9.) **Microan'oüs.**

cc. Tail feathers all pure white.....(Page 9.) **Gygis.**

[1] For the Key to the Higher Orders see last pages of the Memoir. [261]

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GENUS **LA'RUS** LINNÆUS.

a. Head entirely white in the summer adults.

b. Primaries uniform pale grey, with no black, and fading gradually into white at the tips (larger, wing more than 16.00). Head, neck, tail and under parts white; mantle grey; the scapulars and secondaries white at their tips. *Female* smaller, often considerably so. *Adult in winter:* Mottled and streaked with pale brown on the head and neck; back and under parts also mottled. *Immature:* The mottling on the upper surface gradually disappears and for a short time the bird appears to be a creamy white. *Young:* Both the upper and under surface streaked and mottled with ash-brown on a paler ground color; the feathers of the mantle margined with buffish white which produces a creamy appearance; upper and under coverts rather boldly marked with brown (Saunders). Length about 25.00–28.00, wing 16.25–18.00 (17.12), tail 7.00–7.50, culmen 2.30–2.70, tarsus 2.40–2.78 (2.57), middle toe with claw 2.35–2.75 (2.55). *Hab.* Bering Sea and adjacent waters northward to Point Barrow; southward in winter to Japan (Ridgway). Kauai,[2] Maui.

1. **L. barrovianus**[3] RIDGW. **Point Barrow Gull.**

bb. Primaries marked with distinct white tips and dark (black) subterminal spaces; the two outer primaries with a distinct grey wedge on the inner web in the summer adults; depth of bill through the angle .50 or more; mantle blue-grey or dark pearl-grey in adults.

c. Larger, length 20.00–23.00, culmen 1.65–2.15, mantle darker grey than in the following species; scapulars and secondaries broadly tipped with white; the outer primary with a large portion of black; the first, chiefly black with about 2.00 of the terminal portion white; the second, with a small grey wedge basally; the third, fourth and fifth, black with white tips and increasing grey wedges; bill, bright yellow with an irregularly shaped spot of intense carmine near the tip of the lower mandible, and a dark spot or bar usually anterior to this on one or both mandibles. *Female* smaller and duller in color. *Adult in winter:* Like the above but head and neck streaked with greyish brown. *Immature:* Autumn birds of the second year show grey on the mantle; upper tail coverts begin to show grey at their bases; tail feathers more uniform umber brown than before, though the coverts are whiter; under parts whitish brown without distinct spots; bill yellower at the base. *Young:* Much darker brown throughout; no signs of grey on the secondaries nor the basal portion of the inner primaries, the paler inner webs being nearly dull brown; tail coverts

[2] The single specimen in the Museum collection is one of two taken on the island of Kauai by Mr. Francis Gay. Both specimens were taken late in the autumn months. While neither specimen agrees as closely with the descriptions at hand as would be desirable, I have seen fit to refer them to *barrovianus*, believing them to be immature birds of that form. This is probably the undetermined species mentioned by Kittlitz. The following measurements are taken from the Museum specimen No. 9305: Length 25.50, culmen 2.00, tail 6.50, tarsus 2.85, toe 2.75; locality, Kauai, H. I.; date, 1899, autumn. There is also a specimen in the cabinet of St. Louis College, Honolulu, taken on Maui by Brother Matthias.

[3] *Larus glaucus*, Brünn, from Laysan (*Dr. Schauinsland*); Hawaii (Henshaw, in Auk, Vol. XVII., p. 201).

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broadly and closely barred; tail feathers umber brown with dull white tips; bill brownish basally, black terminally; tarsi and toes brown; wing 15.00–16.75, depth of bill at the angle .60–.75, tarsus 2.00–2.60, middle toe and claw about 2.10. *Hab.* Western North America, wintering on the Pacific coast. Hawaiian Islands (accidental; one specimen in St. Louis College cabinet).

2. L. californ'icus LAWR. **California Gull.**

cc. Smaller, length 18.00–20.00; mantle lighter grey; bill with a black band in adult. *Adult:* Bill greenish yellow, crossed near the end by a distinct black band; tip sometimes orange; feet pale yellow. *Immature:* Head slightly streaked; mantle grey with a few brown feathers about the bend of the wing; outer primary without indication of a white spot; tail feathers white with the remains of the broad dark subterminal band. *Young:* Above brownish dusky varied with dull buffish white; quills blackish, the shorter ones greyish basally with white tips; bill blackish, paler at the base; wing 13.25–15.25, culmen 1.55–1.75, depth of bill at angle .50–.65. *Hab.* Whole of North America. Hawaiian Islands (accidental; one specimen in St. Louis College cabinet).

3. L. delawaren'sis ORD. **Ring-billed Gull.**

aa. Head uniform black or dusky in summer adults; lower parts, rump and tail pure white; mantle grey; tarsus not longer than the middle toe and claw; wing more than 10.00 (culmen more than 1.00); bill reddish brown, with a darker subterminal band; head and upper part of the neck plumbeous black with a conspicuous elongated white patch both above and below the eye; lower parts white with a rosy blush in freshly killed birds; the secondaries broadly edged with white; primaries all tipped with white and all bluish grey next the shafts on the upper part, except the outermost which has the outer web black and some white on the inner web, with a black subterminal bar. *Female* similar. *Adult winter:* Like above with the head white, spotted and mottled with blackish on the upper surface. *Immature:* Similar, but with a larger proportion of black in the primaries. Length 13.50, tail 4.25, tarsus 1.47, toe with claw 1.50, culmen 1.25, depth of bill at gonys .32, wing 11.25. *Hab.* Interior of North America from Iowa northward, breeding; south to Middle America and Western South America to Peru. Maui.[4]

4. L. franklin'ii SW. & RICH. **Franklin's Gull.**

GENUS **STERNA** LINNÆUS.

a. Crown black in the breeding plumage (more or less varied with white in winter); wings rarely over 12.00; both webs of the outer tail feathers white at the base.

b. Mantle, back of neck, rump, upper tail coverts and all the tail feathers except the outer ones (streamers) uniform sooty black; forehead and superciliary stripe white; *superciliary stripe not reaching back over the eye;* under parts white with a greyish tinge on the abdomen; bill and feet black. *Winter adult:* Like above except

[4] The above description and measurements are based on the single *winter* specimen in the cabinet of St. Louis College, Oahu. The specimen was taken by Brother Matthias on Maui, and is the first record of the species being taken here.

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with white flecked through the black of lores and crown. *Young:*[5] Brownish black above, darkest on the upper wing coverts; outer tail feathers almost as sooty black as middle ones, except towards their tips. *Half-fledged birds:* Feathers of the mantle are blackish with broad white tips. Length 15.00–17.00, wings 11.75–12.00, tail 7.00–7.50 (forked for more than 3.00), tarsus .95–1.00, toe .99–1.05, culmen 1.80–1.85, depth of bill .45–.48, gonys .85. *Hab.* Tropical and juxta-tropical seas. Hawaiian Islands. Pl. XVI., 9153, 9155.

5. S. fuligino'sa GMEL. **Sooty Tern.**

bb. Back, rump, tail coverts, wing coverts, outer edge of secondaries and tail feathers, except the outer pair, dark sooty grey; crown, lores and nape black; primaries chiefly smoky grey with the white wedges on the inner webs; wings never less than 10.00; under parts and forehead, white; *white superciliary stripe extending back over the eye. Winter adult:* Similar to the above, but showing more white in the forehead. *Young:* Mantle with more brownish tinge of grey; head mottled black and white; wing 10.75, culmen 1.60, tarsus .85, toe 1.15. *Hab.* Central Pacific Ocean. Laysan, etc.

6. S. luna'ta (PEALE). **Grey-backed Tern.**

aa. Crown always white, sometimes with a brownish tinge; nape, orbit and ear coverts black; mantle pale grey; in front of the eye a black triangular patch, the point of which does not reach to the base of the bill; from the eyes a black band extending about the back of the head; band broadened and more or less prolonged down the back of the neck; neck and under parts white; mantle and rump pearl grey; shafts of the primaries white; outer primary with the outer web blackish, streak next the shaft on the inner web blackish or greyish black. *Winter adult:*[6] Similar, with less black about the head. *Immature:* Similar to the above, but there is a brownish tinge to the back of the nape, the wing coverts are ash-grey, and a dark line runs along the carpal joint (Saunders). *Young:* Forehead and crown buffish white with a black streak which becomes confluent on the nape; feathers of the mantle and tail grey, barred with ash-brown and tipped with buff. Length about 13.25–13.50, wing 9.50–10.00, tail 3.90–4.40, bill 1.25–1.40, tarsus .75–.80, toe .95–1.00. *Hab.* Southern and Western Pacific Ocean, north through Polynesia generally, the Philippine Islands and China. Its range appears to depend in a great measure upon the existence of coral islands of a certain size, and is probably still more extensive (Saunders). Kauai; accidental.

7. S. melanau'chen TEMM.

[5] A September bird from Laysan Island has the head and neck dark sooty brown; lighter sooty brown below, extending back to the abdomen and over the flanks; belly white; tail uniform blackish brown, both inner and outer webs tipped with dirty white; upper tail coverts, rump, and greater wing coverts uniform with the tail; lesser wing coverts darker, edged with fulvous or whitish; edge of wing white, under wing coverts stone-grey. Length about 14.75, wing 10.25, tail 5.25, tarsus .90, toe 1.05, bill 1.25, gonys .45, depth of bill .35. As may be seen by the above the bill pattern is totally different from adult *fuliginosa* as well as some slight variation in all of the other measurements. It was with difficulty that the specimen was made out *fuliginosa*.

[6] The two specimens in the Museum were taken at Mana, Kauai, by Mr. A. F. Judd during the winter of 1892–3. Both have the white foreheads assumed by this species, while the remainder of the plumage is badly worn. This seems to be the first record of this species being taken in the Hawaiian Islands. The above measurements are taken from these specimens. The *S. bergii* of Dole has never been noted from Hawaii since his early reference to it, *Proc. Bost. Soc. Nat. Hist.*, 1869, p. 306. *Bergii* is, in general appearance, somewhat similar to *melanauchen*, though the former is much the larger (length .20–.21, wing 14.25, bill 2.05).

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GENUS **ANOUS** LEACH.

Plumage uniform sooty brown, becoming hoary on the forehead and top of the head (larger, wing 10.30–11.00); crown and forehead lavender-grey. *Summer adult:* Forehead nearly white at the base of bill, passing to lavender-grey, which becomes lavender on the hind neck; primaries and tail feathers nearly black. *Adult female:* Similar, but a trifle smaller and with a weaker bill. *Young* similar. Length 13.00–16.25, wing 10.30–11.00, culmen 1.70–1.75, tarsus .90–.93, tail 5.90–6.25, toe 1.52–1.55, depth of beak .40. *Hab.* Tropical and juxta-tropical seas, wide-ranging. Hawaiian Islands.

Pl. XVI., 7903, 9157; XVII., 7900. **8. A. stol'idus**[7] (LINN.). **Noddy.**

GENUS **MICROANOUS** SAUNDERS.

Middle toe and claw shorter than the exposed culmen; bill slender and long; the distance from the angle of the gonys to the tip of the bill greater than to that of the gape; lores deep black; cheeks decided plumbeous; nape, shoulders and tail, dull lavender grey; lower parts dark sooty brown; forehead and crown dull greyish white inclined to a silvery white. *Young:* Similar but browner. Length about 13.00, wing 8.75–9.00, tail 5.25, tarsus .80, middle toe 1.30, culmen 1.50–1.85 (Laysan specimen with darker lores), depth of bill .32. *Hab.* Hawaiian Islands.

Pl. XVII., 9164, 9165. **9. M. hawaiien'sis** ROTHS. **Hawaiian Tern, Noi'o.**

GENUS **GYGIS** (Ji'jis) WAGLER.

Middle toe and claw shorter than the exposed culmen; bill black, stout at the base and sharply pointed; pure white except a narrow ring about the eye which is black; toes slender, middle toe abnormally long, webs deeply excised (stouter, tail more pointed); shafts usually brownish. *Young* like above. Length 12.00–13.00, depth of bill .40, wing 9.50, tail 4.25–5.00, tarsus .45–.50, middle toe with claw 1.10, culmen 1.80. *Hab.* Central Pacific generally. Laysan, etc.

Pl. XVII., 7892. **10. G. alba kittlitz'i** HART. **White Tern.**

[7] A specimen of *stolidus* in the Museum series (Coll. No. 1309), which varies somewhat from the typical form, is minutely described by Mr. Seale in his "Field Notes on the Birds of Oahu, H. I.," *Occasional Papers of the B. P. Bishop Museum*, Vol. I., No. 2, p. 35.

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Order TUBINARES.—Tube-nosed Swimmers.

Families.

Nostrils opening from the anterior end of horizontal nasal tubes.

a. Tubes widely separated by the intervening culmen; wings narrow and long; birds of large dimensions.....(Page 10.) **Diomedeidæ.**

aa. Both nasal tubes united; no intervening culmen; birds of medium or small size.....(Page 10.) **Procellariidæ.**

Family **DIOMEDEIDÆ.**—Albatrosses.

Genus.

Sides of the lower mandible without sulcus (a longitudinal groove); tail short and rounded and not more than one-third the length of the wing; *base of upper division of the bill wide and closely joined by the lateral division*.....(Page 10.) **Diomed'ea.**

Genus **DIOMEDEA** Linnæus.

Culmen slightly concave; bill somewhat compressed. Lateral division of the bill narrower at the base than in the middle. (Sub-genus *Phœbastria*, Reich.)

a. Abdomen sooty brown (wings never more than 21.00, smaller and bill more slender); dark sooty brown above; bill dark brown; under wing coverts and auxiliaries sooty brown; sexes similar. *Young:* Similar to adult, but with sides of head white; upper tail coverts whitish. Length about 29.00–36.00 (33.00), wing 19.50, tail 5.60, bill 4.00, tarsus 3.40, toe 4.90. *Hab.* North Pacific Ocean. Laysan, etc.

Pl. XVIII., 8742. **11. D. nigripes** And. **Black-footed Albatross.**

aa. Abdomen white (bill rather slender); upper tail coverts white; under wing coverts blackish brown and white mixed; wings and back blackish brown; tail brown. *Female* similar. *Young* similar to adult. Length about 32.00, wing 19.00, tail 6.00, culmen 4.50, tarsus 3.60, toe 4.75. *Hab.* Gardner, Lisianski and Laysan.

Pl. XVIII., 8746. **12. D. immutab'ilis** Roths. **Gooney.**

Family **PROCELLARIIDÆ.**—Petrels.

Genera.

Common characters as above (with thirteen or more secondaries); bill shorter than tarsus; tail feathers 12 to 14 in number.

a. Of medium or small size (wing less than 15.00); *wing more than 7.00;* culmen more than half as long as the middle toe and claw. (Sub-family *Fulmarinæ.*)

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b. *Partition between the nostrils very thin, i. e.*, narrower than the width of a single nostril and within the nasal tube; *depth of the bill at the shallowest part more than one-fourth the length of the lower mandible measured along the side;* tarsus not compressed.

c. *Wing more than twice the length of the tail;* tail moderate, rounded (12 feathers); nasal tubes directed straight forward (claw of hallux small, .10); nail of lower mandible making up more than one-third the length of the mandible measured along the side. Plumage and size differing among species..(Page 11.) **Æstrela'ta.**

cc. *Wing less than twice the length of the tail;* tail of 12 feathers long and cuneate, being graduated for a third of its length; nail of the lower mandible making up less than a third of the length of the mandible measured along the side; plumage dark; nasal tubes fleshy at ends and directed forward and upward..(Page 12.) **Bulwer'ia.**

bb. *Partition between the nostrils thick, i. e.*, thicker than the outer edge of one of the nostrils; the partition scarcely, if any, shorter than the outer edges of the tubes; tarsus compressed and with a ridge on the front edge; space between the end of the nasal tubes and the base of the unguis (nail on the tip of upper mandible) more than the length of the latter (nostrils at least partially visible from above; wings less than 15.00).

d. *Nostrils elevated above the line of the culmen* when viewed from the side; nasal tubes elevated and inflated anteriorly; under wing coverts dusky; breast white..... (Page 12.) **Prio'finus.**

dd. *Nostrils not noticeably elevated above the line of the culmen* when viewed from the side; compressed anteriorly and narrower than at the base; edge of nostrils entirely visible from above (under wing coverts white or else lower parts dusky)..... (Page 13.) **Puff'inus.**

aa. *Wing less than 7.00;* tarsus not perceptibly longer than middle toe and claw; *tail forked*, or at least emarginate.....(Page 13.) **Oceano'droma.**

Genus **ÆSTRELATA** Bonaparte.

Exposed portion of inner web of primaries beneath dark; bill wide at the gape; under parts mostly white; crown and back of the head dark; upper tail coverts uniform with the back; tail dusky (outer feathers sometimes mottled with white); *auxilliaries and under wing coverts mostly white inwardly, margined with dark.*

a. *Larger and darker above;* under tail coverts greyish dusky, very abruptly white beneath the surface; upper parts, including hind neck and upper tail coverts, uniform brownish slate, darker on the wings and tail, and nearly black on the head; the feathers of the hind neck and upper tail coverts (the latter very abruptly) white beneath the surface; forehead, lores, cheeks and entire lower parts white; the sides and longer tail coverts sometimes barred with dusky; wing 11.80–12.00, tail 5.50–5.75

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(graduated for about 2.40), culmen 1.22, tarsus 1.40, middle toe with claw 1.78. *Hab.* Middle Pacific from Hawaiian Islands to Galapagos (Ridgway). (No specimen in Museum.)

13. Æ. phæopyg'ia SALV. **Dark-rumped Petrel.**

aa. *Smaller and paler above;* upper tail coverts ashy-grey, much less abruptly white beneath the surface (bill stouter); *larger; under wing coverts mostly dark;* feathers of the back distinctly edged with grey; under parts white, except along the sides of fore breast. *Female* similar. *Young:* Smaller, with the under tail coverts as long as or longer than the tail feathers; upper back and tail coverts much more broadly edged with blue-grey; whole aspect of the back lighter; less blue-grey on the sides of fore breast. Length 11.15–14.00 (12.75), wing 7.40–8.60, tail 3.20–4.70, culmen 1.02–1.10, tarsus 1.10–1.15, middle toe 1.40–1.50, inner toe 1.15–1.20. *Hab.* North Pacific Ocean. Laysan, etc. The following table will show the variation in measurements of young *fledged* birds and adults:—

	Juvenile (June 19).		*Adult (September).*	
	Male.	Female.	Male.	Female.
Length	11.50	11.15	12.50	14.00(?)
Wing	7.50	7.40	8.60	8.75
Tail	3.70	3.20	4.45	4.70
Culmen	1.08	1.02	1.10	1.10
Tarsus	1.15	1.15	1.15	1.15
Middle toe	1.50	1.40	1.40	1.50
Inner toe	1.20	1.15	1.15	1.15

Pl. XIX., 7907, 7908. **14. Æ. hypoleu'ca** SALV. **Bonin Petrel**

GENUS **BULWE'RIA** BONAPARTE.

Plumage entirely dusky sooty brown, darker on the upper parts (smaller); under tail coverts falling short of the end of the tail by more than .50; *the greater wing coverts lighter brown on their edges*, forming a quite well defined patch; quills nearly black. *Downy young:* uniform dark sooty brown. Length about 10.00, wing 7.75, tail 4.50, culmen .90, tarsus 1.20. *Hab.* North Pacific Ocean. Laysan, Kauai, French Frigates, Hawaii (Mills).

Pl. XIX., 8768. **15. B. bul'weri** (JARD. & SELBY). **Bulwer's Petrel.**

GENUS **PRIO'FINUS** HOMBR. & JACQ.

Tail long, cuneate; under surface of body white; feathers of the head and upper plumage not edged with white; back, greater wing coverts and primaries entirely deep sooty brown with slaty brown beneath; feathers of the back edged with paler brown; sides of the neck greyish, mottled; under tail coverts dusky; auxiliaries dusky. Length ♂ 17.50 ♀ 19.00, wing 11.25–12.00, tail 6.00, culmen 1.50–1.55, tarsus 1.75, middle toe 2.15–2.25. *Hab.* North Pacific Ocean. Laysan, Kauai, etc.

Pl. XIX., 7928. **16. P. cunea'tus** (SALVIN). **Wedge-tailed Shearwater, Unu kane.**

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GENUS **PUFFINUS** BRISSON.

a. Lower parts uniform dusky black (wing never over 10.00); bill deep black; under wing coverts deep sooty black (darker); primaries and tail feathers black. Length about 15.00, wing 9.10, tail 3.75, culmen 2.25, tarsus 1.70, middle toe 2.00. *Hab.* Central Pacific Ocean. French Frigates, Laysan.

Pl. XIX., 7942. **17. P. nativita'tis** STREETS. **Christmas Island Shearwater.**

aa. Lower parts uniform white including auxiliaries and the central under tail coverts; primaries dark beneath; head, neck and back, including wings and tail, a very uniform black; the edge of the feathers sometimes brownish; flanks and outer under tail coverts blackish; border of under wing coverts blackish. Length 14.60, wing 9.25, culmen 1.30, tail 3.45, tarsus 1.80, toe 2.20, depth of bill at base .50. *Hab.* Kauai.

Pl. XIX., 9307. **18. P. new'elli**[8] HENSHAW.

GENUS **OCEANO'DROMA** REICHENBACH.

Plumage sooty black; *upper tail coverts more or less white;* base of all the tail feathers white except the centre pair (tail not deeply forked; longer of the upper tail coverts tipped with black. Length about 8.75, wing 5.90, tail 2.75, tarsus .82, middle toe .95, tibia 1.60, culmen .58.[9] *Hab.* Central Pacific Ocean. Kauai, French Frigates, Niihau(?).

19. O. cryptoleucu'ra.[10] **Hawaiian Storm Petrel, Oeoe.**

Order STEGANOPODES.—Totipalmate Swimmers.

Families.

a. Tail cuneate (or rounded); web between the toes only slightly emarginate; no terminal hook to the bill.[11]

b. Middle tail feathers greatly elongated; whole head feathered; bill conical, compressed and pointed; nostrils plainly visible..(Page 14.) **Phaëthon'tidæ.**

[8] The description is taken from a specimen given to the Museum by Mr. Francis Gay, April 17, 1900 (B. P. B. M. No. 9307). During the interval between the writing and the publication of the description Mr. Henshaw has described a specimen taken by Mr. M. Newell (Brother Matthias), which seems to be the same as the Kauai specimen in the Museum. I therefore withdraw my *manuscript* name (with due apology to Mr. Gay) in favor of Mr. Henshaw's *published* name. See Auk (1900), Vol. XVII., p. 246. The locality of Mr. Henshaw's type is at fault. It doubtless is a misprint and should be Waihu Valley, Island of Maui, in the place of "Waihu Valley, Island of Mani."

[9] Female in the collection taken by Mr. A. F. Judd on Kauai during the winter of 1892–93, from which the above measurements were taken.

[10] Dr. Schauinsland, in his list of the birds of Laysan Island, adds *O. fuliginosa* (Gm.) to the Hawaiian fauna. It can be easily distinguished from *O. cryptoleucura* by its larger size (length .10, wing 7.50) and having the upper tail coverts the same color as the back.

[11] Since the preparation of the above I have a list of the birds obtained on Laysan by Dr. Schauinsland, Director Städt. Museum, Bremen, in which he gives *Phalacrocorax plagicus*, Pall. The species may be identified by the following: The upper mandible terminating in a distinct hook; *tarsus longer than the hind toe and claw;* with a small, scarcely noticeable gular sac; bill slender with outline straight; tail much longer than the wing, graduated and composed of twelve feathers; culmen less than 2.50; feathers on the lower jaw projecting forward beyond the anterior angle of the eye; head and neck rich glossy silky violet black; more purplish towards the head, becoming silky dark green on the lower parts. *Breeding plumage:* Neck and rump ornamented with very narrow white feathers. *Young:* Uniform brownish dusky. Length 25.00–29.00, wing 9.50–10.60. *Hab.* Coast of Asia from Kamschatka to South China, from Alaska to South Mexico(?). (Hawaiian Islands, Laysan.—*Dr. Schauinsland.*)

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bb. Middle tail feathers not greatly produced; no external nostrils; head partly feathered; bill thick through the base.....(Page 14.) **Sul'idæ.**

aa. Tail deeply forked; webs between the toes deeply emarginate; tarsus very short, not longer than the hind toe and claw; wing and tail exceedingly long.

(Page 15.) **Fregat'idæ.**

FAMILY **PHAETHONTIDÆ.**—TROPIC BIRDS.

Genus.

Characters the same as for the family.....(Page 14.) **Pha'ëthon.**

GENUS **PHA'ETHON** LINNÆUS.

Plumage very close and satiny; general color white, usually tinged with pink or salmon color, with some black on the upper parts.

a. *Outer web of primaries white* to the base; elongated tail feathers carmine with black shafts; a black comma-shaped patch on the side of the head, starting at the corner of the mouth and prolonged backward behind the eye; inner secondaries with a black band down the middle; flank feathers with a greyish black shaft stripe; feet black; at the base of toes yellow; bill red. *Female* similar. *Very young* have the whole back, head and wings white barred with black. Length 30.00–36.00, culmen 3.50–3.70, depth of bill .85–1.05, wing 12.50–13.00, tail without middle feathers 5.00, with middle feathers 16.50–20.00, tarsus 1.15–1.20. *Hab.* Central Pacific and Indian Ocean. Laysan, etc.

Pl. XX., 8554, 9715. **20. P. rubricaud'a** BODD. **Red-tailed Tropic Bird.**

aa. *Outer primaries with the outer web black* for the greater portion of its length; elongated tail feathers white or apricot color; black on outer web of first primary falling short of the tip by an inch or more; basal two-thirds of both mandibles more or less blackish horn color; black on the side of the head much as in *P. rubricauda;* a black band along the wing formed by the black tips of the median wing coverts; innermost secondaries and scapulars with a very broad oblique black band; shaft of long tail-feather black above, white below. Length 23.00–28.00, wing 10.50–11.00, culmen 2.00, depth of bill .70, tarsus .75, middle toe 1.40, tail without plume 4.50, tail with long feathers 16.50–18.00. *Hab.* Inter-tropical seas. Hawaiian Islands.

Pl. XX., 9895, 9896, 7599. **21. P. leptu'rus** LACEP. & DAUN. **White-tailed Tropic Bird.**

FAMILY **SULIDÆ.**—GANNETS.

Genus.

Characters the same as for the family.....(Page 14.) **Sula.**

GENUS **SULA** BRISSON.

Bill sub-cylindrical and tapering to a point, the extremity of which is slightly curved; *whole of lower jaw together with the throat and chin naked. Young:* Upper parts unicolor. (Sub-genus *Sula.*)

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a. *Plumage of the head and neck, as well as most all of the upper parts, pure white.*

b. *Greater part of tail feathers brownish black;* naked skin of the face and throat blackish (blueish in life); neck and body entirely white; primaries, secondaries together with most of the tail, brownish black; wing coverts white. *Young:* Head, neck and upper parts plain dark brown; part of the neck streaked with white. *Nestlings* covered with white down. Length 25.00–29.00, wing 15.00–17.00, tail 8.25–10.00, culmen 3.60–4.25, depth of bill 1.40–1.60, tarsus 2.25, middle toe 3.25. *Hab.* Central Pacific Ocean. Laysan, French Frigates, Midway, etc.

Pl. XXI., 7933. **22. S. cy'anops** SUND. **Blue-faced Booby.**

bb. *Tail pure white;* outer web of primary feathers hoary grey; outer webs of secondaries and their coverts hoary; smaller wing coverts white like the rest of the body; all more or less rich white and tinged with buff; feet reddish. *Young:* Above sooty brown, hind neck and lower parts light smoky grey (plumage extremely variable). Length 23.00–27.00, wing 15.00, tail 6.75–7.25, culmen 3.40–3.50, depth of bill 1.40. *Hab.* Inter-tropical seas. Niihau, Oahu, Lisianski, Laysan, French Frigates, etc.

Pl. XXI., 7933. **23. S. pisca'tor** (LINN.). **Red-footed Booby.**

aa. *Plumage of the upper parts uniform deep sooty brown;* head, neck and chest deep sooty brown like the back; lower parts white; tail and wings uniform with the back. *Young:* Nearly uniform sooty brown, paler beneath. Length 30.00–31.00, wing 15.50, tail 7.50, tarsus 1.80, culmen 4.00 (4.25 ♀). *Hab.* Tropical seas. Niihau, Laysan, etc.

Pl. XXI., 8752. **24. S. sula** LINN. **Booby.**

FAMILY **FREGATIDÆ.**—MAN-O'-WAR BIRD.

Genus.

Characters for the genus same as for the family.....(Page 15.) **Frega'ta.**

GENUS **FREGATA** CUVIER.

Culmen more than 4.25; bill long and strongly hooked at the extremity, both mandibles being curved downward. *Male:* Breast and sides sooty black and culmen strong; feathers of the head, back and scapulars elongated, pointed, and a glossy oil-green with a bronze sheen (no white on the flanks); gular pouch scarlet orange (fading). *Female:* Breast and sides white; culmen longer (5.00); head and neck not so glossy; back of the neck, lesser and median wing coverts brown with paler margins. *Young, both sexes:* Head and neck as well as upper half of chest white with an occasional rusty feather about head and sides; upper breast dark sooty brown; otherwise as in the female. Length 37.50–41.00, wing 23.00–25.00, tail 15.00, tarsus .65. *Hab.* Tropical and sub-tropical seas. Hawaiian Islands.

25. F. a'quila LINN. **Man-o'-war Bird, Iwa.**

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Order ANSERES.—Lamellirostral Swimmers.

Family.

Only one family. Characters same as for the order....(Page 16.) **Anatidæ.**

FAMILY **ANATIDÆ.**—DUCKS, GEESE, ETC.

Genera.

a. Tarsus shorter than middle toe with claw.

b. No trace of teeth (lamellæ) along the side of lower mandible; distinct tooth serrations along the upper edge (Sub-family *Merginæ*); culmen shorter than tarsus; bill narrow and peculiar.....(Page 17.) **Mergan'ser.**

bb. A very distinct row of teeth along the side of the lower mandible, in addition to the series along the upper edge. (Sub-family *Anatinæ.*)

c. *Hind toe narrowly lobed;* neck shorter than the body; a colored speculum on the wing.

d. *Bill not spatulate* (upper wing coverts not blue, more usually dark grey;) tail feathers rather narrow and pointed at the tips.

e. *Tail moderate* with the centre pair of feathers not very long and tail graduated for less than one-third its total length; bill rather broad and about the length of the head.....(Page 17.) **Anas.**

ee. *Tail long*, with the central pair of feathers very long and pointed; culmen longer than the middle toe (speculum broader than the light band at the tip of the secondaries).....(Page 18.) **Da'fila.**

dd. Bill spatulate, *i. e.*, broad at the end and narrower at the base; upper wing coverts blue (no soft membrane on the sides of the bill towards the tip).

(Page 18.) **Spat'ula.**

cc. *Hind toe with a broad membranous lobe* (Sub-family *Fuligulinæ*); feathers on the lores not reaching beyond posterior border of nostrils; graduation of the tail much more than the length of the bill from the nostrils; distance from anterior end of nostrils to tip of bill much greater than the same place to loral feathers.

(Page 18.) **Charitonet'ta.**

aa. Tarsus equal to or longer than the middle toe without the claw; neck moderately long, no cere on the bill. (Sub-family *Anserinæ.*)

f. *Serrations on the cutting edge of upper mandible visible from the outside* for the greater portion of the length of the tomium; bill very stout, its depth through the base more than equal to the length of the culmen; color of adult either white or bluish with black primaries.....(Page 19.) **Chen.**

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ff. *Serrations on the cutting edge of upper mandible not visible from the outside*, except at the base; tomium almost straight; bill moderate but strong.

g. *Web of feet not deeply excised, i. e.*, cut away from back along both sides of the middle toe.....(Page 19.) **Branta.**

gg. Web of the feet deeply excised.

(Page 19.) **Nes'ochen.**

GENUS **MERGANSER** BRISSON.

Distance between nostrils and nearest feathers on the sides of upper mandible decidedly less than the depth of the upper mandible at base; feathering on sides of base of upper mandible projecting far forward, forming a very decided though obtuse angle. *Adult male:* Head dull greenish black, the occiput with a long pointed crest; neck and sides of chest dull brownish buff or light cinnamon streaked with black; other lower parts mainly white, usually tinged with cream color (Ridgway). *Female:* Head and neck reddish brown, darkest on the crown; back scapulars and small wing coverts umber brown; edge of the feathers paler; a white patch on the wing; under parts white. Length 20.00–25.00, wing 8.60–9.00, culmen about 2.50, tarsus 1.80–1.90, middle toe 2.40. *Hab.* Northern portion of northern hemisphere, breeds northward. Hawaii,[12] Oahu.

26. M. serra'tor (LINN.). **Red-breasted Merganser.**

GENUS **A'NAS** LINNÆUS.

Culmen shorter than the middle toe; central tail feathers but slightly curled, some specimens not at all.

a. *No white ring around the eye;*[13] speculum greenish blue; under tail coverts in fully fledged male(?) more or less blackish, edged and mixed with chestnut; rump blackish, with varying amount of chestnut; abdomen with pale greyish chestnut ground streaked and spotted with blackish; neck and breast of the same chestnut as the under tail coverts, with oval blackish centres to the feathers of the chest, which become mere streaks on the neck, most numerous on the chin (one specimen with less black on the chin); lesser wing coverts dark grey, with some paler edges; under wing coverts white; feet orange; speculum edged with a band of black followed by a white one (variable in width in front), behind by a black band followed by a white one equal to or wider than the black. *Female* similar. Length ♂ about 18.50 (Seale), wing 9.10–9.50, tail 3.50, culmen 1.80, tarsus 1.35, middle toe 2.10, depth of bill .68–.70; ♀ wing 8.50, tail 3.60, bill 1.80, tarsus 1.38, toe 2.00. *Hab.* Hawaiian Islands. Pl. XXII., 9168, 9424. **27. A. wyvillia'na** SCL. **Hawaiian Duck, Koloa maoli.**

aa. *Ring of white feathers about the eye;* centre pair of tail feathers but little curled at the tips. *Male:* General color of plumage rufescent; head and nape with a

[12] Mr. Henshaw reports the taking of two specimens near Hilo, November 1899. See Auk, Vol. XVIII., p. 203. I am also informed that it has been taken on Oahu.

[13] Dr. Schauinsland's list adds *A. boscas*, Linn., from Laysan. It is distinguished from other Hawaiian ducks by having no white ring about the eye, and with the speculum greenish blue. Length 24.00. It is hardly possible that the Doctor has confused this with the much smaller form which is indigenous to Laysan.

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greenish lustre, especially on the nape; throat mixed with a few white feathers; back, fore neck, breast and flanks with dark rufescent markings. *Female:* Similar, but differs in having more white on the chin; the upper throat much duller; some of the upper and under tail coverts paler rufescent with dusky marks or bands; speculum blackish in female. Length ♂ 16.00–16.50, wing 7.10–8.00, tail 3.30–3.50, tarsus 1.25–1.55, culmen 1.38–1.50, toe 1.80–2.00. *Hab.* Laysan Island.

Pl. XXII., 8745. **28. A. laysanen'sis**[14] ROTHS. **Laysan Teal.**

GENUS **SPAT'ULA** BOIE.

Longer scapulars with a white band along the centre part; abdomen deep chestnut; head and upper portion of the neck deep glossy green; lower neck, breast and outer scapulars white; rump and upper tail coverts dark glossy green with pale edges; *upper wing coverts and outer edge of the two longest scapulars pale blue. Female:* General color of upper parts brown, each feather edged with a broad reddish margin; throat reddish and unspotted. *Young* similar to adult female. Length 17.00–21.00, wing 9.00–10.00, culmen 2.60–2.90, width of bill at end 1.10–1.20, at base .60, tarsus 1.40–1.50. *Hab.* Northern hemisphere. Hawaiian Islands. (No specimen in Museum.)

29. S. clypea'ta (LINN.). **Shoveller.**

GENUS **DAF'ILA** STEPHENS.

Tail feathers not barred across; centre tail feathers blackish, lateral ones grey with pale whitish margins; *head dark, hair brown;* a narrow band at the tip of the last row of wing coverts cinnamon (larger, culmen 1.85–2.25); anterior part of the sides of neck, breast and abdomen greyish white; the breast with very narrow, brown, zigzag bars; head and upper neck hair brown, with a faint gloss on the sides of the occiput. *Male:* Length 26.50–30.00, wing 11.10, tail 7.50–9.50, culmen 2.08, tarsus 1.80. *Female:* Smaller; tail feathers blackish, barred irregularly across with whitish or ochraceous; above greyish dusky varied with irregular bars of yellowish white or pale ochraceous, each feather, except on throat, streaked with blackish. Male in first breeding plumage has pale margin to the wing coverts, and most of the feathers of the rump are broadly barred. *Young male* similar to adult female. *Hab.* Northern hemisphere southward. Hawaiian Islands.

30. D. acu'ta LINN. **Pintail, Koloa mapu.**

GENUS **CHARITONET'TA** STEJNEGER.

Head and upper half of the neck rich metallic green with a purplish gloss on the crown; with a patch of white extending from behind the eye across the occiput; lower neck, lower parts, secondaries and scapulars white; back and upper parts black. *Female:* Head and neck brown with faint gloss, a white patch on cheeks and ear coverts; upper parts blackish brown, darkest on rump; under parts white tinged more

[14] Dr. Schauinsland's list gives *Nettion crecca*, Linn., *Querquedula circia*, *Clangula albeola*, Linn., and *Mareca americana* (Gmel.), from Laysan Island. These references are interesting additions to the Hawaiian birds, and are of value in the study of distribution.

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or less with brownish grey. Length about 12.50, wing 6.25, tail 2.45, culmen 1.15, tarsus 1.12, toe 2.00, depth of bill .60. *Hab.* North America. Maui.[15]

31. C. albe'ola (LINN.). **Buffle-head.**

GENUS **CHEN** (Ken) BOIE.

Adult with the whole head and at least part of the neck white as well as the remainder of the plumage, except the primaries and their coverts; bill a deep purplish (in life) with a white nail; primaries black. *Young:* Head, neck and upper parts pale greyish, the feathers of the latter with whitish edges, and striped medianally with darker, especially wing coverts and tertiaries; rump, tail coverts, tail and lower parts plain white. Length 23.00–28.00, wing 14.50–17.00 (16.36), culmen 2.55–2.70, tarsus 2.80–3.25 (3.01), middle toe 2.00–2.50 (2.34). *Hab.* Western America, breeding in Alaska, migrating south. Hawaiian Islands. (No specimen in the Museum.)

32. C. hyperbore'us[16] (PALL.). **Lesser Snow Goose.**

GENUS **BRANTA** SCOPOLI.

Bill and feet entirely black at all ages; tail coverts white; tail and quills uniform black; upper parts brownish, the feathers with lighter tips.

a. *Head partly white*, a white triangular patch on the cheek usually meeting on the throat; lower parts deep brownish or brownish grey (often not much paler than the upper parts) abruptly defined against the white of anal region; (*smaller size, wing less than 16.00, culmen less than 1.25;*) tail feathers usually 14 to 16 in number. Length 23.00–25.00, wing 13.60–14.00, culmen .95–1.15, tarsus 2.40–2.75. *Hab.* Pacific coast of North America, breeding at Norton Sound, south in winter. Hawaiian Islands.[17]

33. B. canaden'sis minima RIDGW. **Cackling Goose.**

aa. *Head entirely black; middle of the neck encircled by a broad white collar*, interrupted only behind; no chestnut on the breast; upper tail coverts very long; upper parts nearly uniform dark sooty brown; lower parts dark sooty slate, not distinctly if at all contrasted with black of chest, but abruptly defined against white of anal region. *Young:* Similar to adult but collar indistinct or obsolete; the larger wing coverts broadly tipped with white. Length 22.00–29.00, wing 12.70–13.50, culmen 1.20–1.35, tarsus 2.20–2.50. *Hab.* Western Arctic America, south in winter along the western Pacific coast. Maui.[18]

34. B. nigricans (LAWR.). **Black Brant.**

GENUS **NES'OCHEN** SALVAD.

Head and throat black, which color extends a little below the eye and down the neck; side of neck tawny buff, becoming lighter towards the lower parts; upper sur-

[15] The specimen from which the above is taken is one in the St. Louis College cabinet. Brother Alfred, the curator, informs me it was taken on Maui by Brother Matthias during his sojourn there.

[16] Hon. Walter Rothschild (through Palmer) *in litt.*; also adds *Anser albifrons gambeli* (Hartl.) from Hawaii.

[17] Hon. Walter Rothschild, *in litt.* Kauai.

[18] Specimen in St. Louis College cabinet taken on Maui by Brother Matthias; also Hon. Walter Rothschild, *in litt.*

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face dull dark umber, the feathers edged or barred with whitish; rump dusky black; abdomen and under tail coverts white. *Female:* Black extends farther down on the side of the head and neck; bill and feet black. Length about 23.00, wing 15.00, bill 1.75, tarsus 3.00, toe 3.25, tail 6.75. *Hab.* Hawaii.

35. N. sandvicen'sis (VIG.). **Hawaiian Goose, Nene.**

Order HERODIONES.—Herons, Ibises, Etc.

Families.

a. *Bill much curved*, long and with nasal groove, linear and produced almost to the tip of the bill. (Sub-order *Ibides.*) Bill almost cylindrical, slender and narrower than deep towards the tip, and curved downward for nearly the whole length.

(Page 20.) **Ibid'idæ.**

aa. *Bill practically straight;* sides of upper mandible without any groove; hind toe inserted on a level with the anterior ones; the middle toe with its claw pectinate (toothed) on the inner edge (Sub-order *Herodii*); bill lance-shaped or compressed and pointed.... ... .(Page 21.) **Arde'idæ.**

FAMILY **IBID'IDÆ.**—IBISES.

Genus.

Anterior aspect of the tarsus plated; head never more than moderately crested and not very noticeable; chin, lores and base of cheeks bare, but the latter feathered to beyond the anterior line of the eye; claw of the middle toe nearly straight. Head of the adult wholly feathered except lores.. ....(Page 20.) **Pleg'adis.**

GENUS **PLEG'ADIS** KAUP.

Adult with head, neck and lower portions uniformly chestnut; upper parts metallic green bronze and purple, most brilliant on upper surface of wings and tail; *lores lake-red in life*, turning brown in skin, or somewhat reddish brown; *feathers surrounding the base of the bill white. Young:* With lower parts greyish brown. Length about 19.00–26.00, wing 9.30–10.80, culmen 3.75–6.00, tarsus 3.00–4.40, middle toe 2.10–2.85. *Hab.* Tropical America in general, west coast from Lower California to Oregon. Hawaiian Islands.[19] (No specimen in Museum.)

36. P. guarauna (LINN.). **White-faced Glossy Ibis.**

[19] Professor Brigham informs me that specimen "found on Molokai, which the natives said was a 'malihini' or stranger, and portions of which were placed in the collection of the society...." (Dole, Hawaiian Annual, 1879, p. 41) was one taken by himself from a flock of five during September or October, 1865. The "fragments" were subsequently sent to Professor Baird at the Smithsonian Institution, Washington, D. C., and have since been lost track of. Professor Brigham has since satisfied himself that the specimen was *Plegadis.* This record, taken in connection with the immature bird collected by Mr. Knudsen on Kauai in 1872, seems to confirm Mr. Ridgway's belief that *P. guarauna* is an accidental visitor to the islands from the west coast of America.

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FAMILY **ARDE'IDÆ.**—HERONS.

Genera.

With the tail composed of 12 feathers; claws rather short and strongly curved (tail feathers stiffer than the coverts); (Sub-family *Ardei'næ;*) bill only moderate, never equal to the length of the middle toe and tarsus combined; bill without distinct serrations on the upper mandible; upper mandible with notch near the tip.

a. *Culmen longer than the tarsus*, the latter longer than the middle toe.

(Page 21.) **Demiegret'ta.**

aa. *Culmen shorter than middle toe and about equal to tarsus;* plumage of young and old very different; bill thick, *i. e.*, culmen rarely more than four times as long as the depth of bill at base..... .....(Page 21.) **Nycti'corax.**

GENUS **DEMIEGRETTA** BLYTH.

General color above and below deep blackest slate, the feathers almost black; feathers of the upper breast elongated like those of the middle back, both paler slaty grey; abdomen and vent feathers tinged with ashy white; a pure white streak down the centre of the throat. *Female* similar. *Young:* Paler and more sooty brown. *White form:* Exactly similar to the grey form, only white. *Hab.* Malay Peninsular and islands to Australia, Islands of the Pacific, Fiji, Samoa, etc., north to bay of Corea. Hawaiian Islands(?).[20]

37. D. sacra (GMEL.). **Sacred Heron.**

GENUS **NYCTI'CORAX** STEPHENS.

Prevailing color, bluish grey in adult, brownish and striped longitudinally with white in the young; gonys nearly straight; culmen and tarsus about equal (Sub-genus *Nycticorax*); base of forehead and eyebrow white; no chestnut on the back and tail; no white on the back; under tail coverts white, as well as the under sides of the body, with a delicate shade of grey, especially on the neck and chest; back and crown glossy black green; wings dove color; head with two or three long slender white plumes, in the breeding plumage. *Female:* Similar to adult male both summer and winter. *Young:* Light brown above, tinged with cinnamon, most marked on the wing quills; each feather of the body with a white tear-shaped shaft stripe; quills with small white tips; sides of head and neck and entire lower parts striped white and greyish brown; throat whitish. Length 23.00–26.00 (25.00), wing 11.60–12.50, tail 4.10–4.75, culmen 2.70–3.35, tarsus 2.72–3.05, middle toe 3.10–3.45, depth of beak .85–.95. *Hab.* Wide-

[20] The reference which President Dole makes (Hawaiian Annual, 1879, p. 52) to this species is the only account of its ever being seen in the Islands. Since he speaks of it as "common all over the group," and "when in full plumage the long feathers of the crest and back are blackish purple, and from the back of the head three long feathers of the purest white hang," etc., it is quite probable that the bird described is the common *Auku*.

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ranging form in suitable localities, North America southwards. Hawaiian Islands. The following table of measurements are from specimens in the Museum:

	Males.			*Females.*		
	Adult.	Adult.	Juvenile.	Adult.	Adult.	Juvenile.
Wing	12.50	12.10	11.60	12.50	12.00	11.50
Tail	4.60	4.70	4.50	4.10	4.75	4.50
Culmen	3.25	3.30	3.10	3.35	3.00	2.70
Tarsus	2.95	3.05	2.85	3.05	3.00	2.72
Middle toe	3.45	3.45	3.20	3.40	3.40	....
Depth of bill	.85	.95	.85	.80	.95	.82

38. N. nycticorax nævius[21] (BODD.). **Black-crowned Night Heron, Auku kohili.** Pl. XXIII., 5584, 9170.

Order PALUDICOLÆ.—Rails, Coots, Etc.

Family.

First primary longer than the seventh; wings less than 10 inches (except in *Porphyrio*); toes very long and slender, with "scallops" along the side in *Fulica;* tail usually quite rudimentary.....(Page 22.) **Rallidæ.**

FAMILY **RALLIDÆ.**—RAILS, GALLINULES AND COOTS.

Genera.

a. No enlarged shield-like process extending over the front part of the head; (Sub-family *Rallinæ;*) middle toe and claw exceeding the length of the tarsus; secondaries practically equal to the primaries in length, or falling short of them by less than the length of the hind toe and claw.

b. Tail feathers very soft and entirely hidden at the ends by the coverts (Hawaii).....(Page 23.) **Pen'nula.**

bb. Tail feathers not decomposed but ordinary and evident with no white secondary quills, the inner toe without the claw longer than the culmen; plumage variegated; wings feebly developed and not as long as the tarsus and toes combined. (Page 23.) **Porzan'ula.**

aa. An enlarged frontal shield.

c. Toes without lobes or flaps. (Sub-family *Gallinulinæ.*)

d. Nostrils oval, in a distinct nasal depression; frontal shield rounded; wings nearly three times the length of the tarsus..(Page 23.) **Gallin'ula.**

dd. Nostrils rounded; no nasal depression; plumage blue (wing coverts ordinary); primaries much longer than secondaries..(Page 24.) **Porphy'rio.**

[21] The Hawaiian *Auku* seems not to differ from the American sub-species by any constant character.

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cc. Toes provided with conspicuous lateral lobes or flaps; primaries about equal to secondaries. (Sub-family *Fulicinæ.*).....(Page 24.) **Ful'ica.**

GENUS **PEN'NULA** DOLE.

General color above dark ruddy brown with darker centres to the feathers, producing a somewhat mottled appearance; wing coverts like the back and very much elongated; quills blackish with rusty brown outer edges; tail feathers blackish, completely hidden by the feathers of the rump; head more uniform brown with a ruddy tinge; sides of the face like the top of the head; throat and under surface of the body dark vinaceous ruddy, a trifle paler shade on the throat. (Measurements from the two mounted specimens in the Museum from Mills collection.) Length about 5.50, wing 2.70 do., tail .75 do., tarsus 1.00, 108, toe (?) .85, culmen .75–.76, depth of bill .30 do.[22] *Hab.* The uplands of Hawaii; rare or extinct.

39. P. ecauda'ta[23] KING. **Sandwich Rail, Moho.**

GENUS **PORZAN'ULA** FROHAWK.

Upper parts generally sandy brown with black centres to the feathers; sometimes white in the centre of the back or rump; wing coverts uniform with the back except for the black streaks; sides of the head, throat and breast dark ashy grey; flanks and under tail coverts sandy brown, like back, with occasional white spots; under wing coverts sandy buff; wing and tail feathers brown with sandy margins. Length about 6.00, wing 2.18–2.25, tail 1.00–1.10, culmen .65–.80, middle toe 1.10–1.30. *Hab.* Laysan.

Pl. XXIV., 7911, 7912. **40. P. palm'eri** FROH. **Laysan Rail.**

GENUS **GALLIN'ULA** BRISSON.

Uniform plumbeous, sides of body streaked with white; base of lower mandible red vermilion like shield; bill tipped with greenish yellow. *Male:* General color of the back dark olive brown reflecting ruddy brown; head and neck blackish fading into slate-grey on the upper neck and under parts. *Winter adult:* Similar, but frontal shield smaller. *Young:* Sooty black more or less mixed with white below. Adults in the

[22] Mr. Wilson, doubtless in error, gives total length about 13.00, wing 6.00, tarsus 3.25, middle toe with claw just under 3.00, culmen .75.

[23] Mr. Scott B. Wilson, in discussing the genus Pennula (Aves Hawaiiensis, p. 171–178) finds grounds for the making of three species—two species in addition to the typical *P. ecaudata.* His description of *P. sandvicensis* (Gmel.) is based on the drawing executed by Mr. W. W. Ellis in 1779, to which Mr. Wilson appends Latham's description which is as follows: "Size small; bill dusky ash color; general color of the plumage pale ferruginous; the feathers on the upper parts darkest in the middle; tail short, hid by the upper coverts; legs dusky flesh color. Inhabits *Sandwich Isles.* Was also found on the island of *Tanna;* but the plumage is darker on the upper parts and the bill and legs yellowish.—Sir Joseph Banks." The Ellis drawing is only the crudest suggestion of the general form of a *Pennula*, while Latham's description is very meagre; and since there seems not to be a single example in any museum, and "no example of the Sandwich Rail has been met with within human memory," it is quite possible that the drawings and description could have emanated from, and therefore should be referred to, the well known extinct and exceedingly rare *ecaudata* of King (1785). *Pennula wilsoni* is based "on the so-called 'Sandwich Rail' in the Leiden Museum." The original description by Dr. O. Finsch is here appended. "Schlegel's type in the Leiden Museum: Upper parts dark ruddy brown with blackish centres to the feathers of the back and wings, producing on these parts well marked longitudinal stripes; head and neck somewhat lighter and uniform ruddy brown like the sides of the head and neck; under parts uniform rusty brown shading into vinous red, a little darker on the flanks; middle of chin somewhat lighter; anal region and lower tail coverts dark vinous red forming a well marked darker patch; primaries blackish very narrowly margined with brown on the outer webs; broad and lax upper tail coverts with very narrow light rusty brown apical margins, showing as lighter undulations; bill and feet light horny brown (as far as can be judged greenish in life). *Sex and habitat* unknown." Measurements (*l. c.* Finsch): Total length 150 mm., wing 73 mm., culmen 19 mm., tarsus 30 mm., tibia 7 mm., middle toe and claw 35 mm.

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autumn and winter have white on the abdomen and under wing coverts. Length about 14.00, wing 6.75, tail 1.50, culmen and shield 2.00, tarsus 2.25–2.50, toe 3.00, hind toe 1.25. *Hab.* Hawaiian Islands.

Pl. XXIV., 9745. **41. G. sandvicen'sis** STREETS. **Hawaiian Gallinule, Alae.**

GENUS **PORPHY'RIO** BRISSON.

Thighs purplish brown; inner secondaries black (with no distinct patch of blue on the throat); under surface uniform bluish except the under tail coverts which are white; general color of back black; primaries black; frontal plate, bill, legs and feet red. Length 17.25, wing 14.50, tail 4.00, culmen and shield 2.70, tarsus 3.35, toe 4.00. *Hab.* Australia, New Zealand, New Guinea. Oahu; introduced.

42. P. melano'tus NEWT. **Alae awi.**

GENUS **FU'LICA** LINNÆUS.

General color above and below slaty grey; under tail coverts black, the lateral ones white with the inner half of the feather black; outer secondaries broadly tipped with white, one specimen with under parts suffused with whitish, and flank stripes wanting in all the specimens in the collection; quills blackish brown; back browner. Length 16.25, 15.60, 16.25; wing 7.00, do., do.; tail 2.10, 2.20, 2.30; culmen including shield 2.25, 2.05, 2.10; tarsus 2.25, 2.15, 2.20; toe 3.25, do., do. *Hab.* Hawaiian Islands.

Pl. XXIV., 9432. **43. F. alai** PEALE. **Hawaiian Coot,**[24] **Alae keokeo.**

Order LIMICOLÆ.—Shore Birds.

Families.

a. Naked portion of the thigh much more than the length of the middle toe; tarsus more than twice the length of the middle toe; nasal groove not extending beyond half the length of culmen.....(Page 26.) **Recurviros'tridæ.**

aa. Naked portion of thigh less than the length of middle toe; tarsus less than twice the length of the middle toe.

b. Toes with distinctly scalloped web, and with a serration along the edge of the planta-tarsi as in the grebes.....(Page 25.) **Phalaropo'didæ.**

bb. Toes without scalloped webs and no serrated edge to the planta-tarsi; nasal groove extending along the greater part of the upper mandible.

c. Front of tarsus covered with a continuous row of transverse scutulæ.

d. Bill slender; exposed culmen longer than middle toe without the claw; end of bill with a more or less rounded or sometimes expanded tip.

(Page 26.) **Scolopac'idæ.**

[24] A partial albino (Museum No. 8708) was collected on Maui by Mr. G. P. Wilder, November 4, 1899.

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dd. Bill stout and pointed, culmen arched toward the tip, very pointed and wedge-shaped at the tip; or, exposed culmen equal to or shorter than the middle toe without the claw.....(Page 29.) **Aphriz'idæ.**

cc. Front of tarsus covered with small irregular or hexagonal scales in front and behind, and with the dentrum or end of the upper mandible enlarged; bill shorter than the tarsus.....(Page 28.) **Charadri'idæ.**

FAMILY **PHALAROPO'DIDÆ.**—PHALAROPES.

Genera.

a. Bill slender, almost cylindrical, not widening towards the end; nostrils separated from the loral feathers by a space equal to the depth of the upper mandible at the base.....(Page 25.) **Phalaropus.**

aa. Bill broad, flattened, somewhat widened toward the end; nostrils somewhat separated from the loral feathers by a space less than the depth of the upper mandible at the base.....(Page 25.) **Crymo'philus.**

GENUS **PHALAR'OPUS** BRISSON.

Web between middle and outer toes extending to or beyond the second joint of the latter; lateral membrane of all the toes distinctly scalloped. (Sub-genus *Phalaropus.*) *Adult female in summer:* Above dark plumbeous, the back striped with ochreous buff; wings dusky, the greater coverts broadly tipped with white; lower parts white; chest and sides of neck rufous. *Adult male in summer:* Similar to the female, but colors duller, the rufous confined to the sides of the neck and less distinct; the chest chiefly mixed with white or greyish. *Winter plumage:* Forehead, supercilliary stripe, sides of head and neck with lower parts generally pure white; top of head greyish; upper parts chiefly greyish; under parts for the most part white. Length 7.00, wing 4.10, tail 1.90, culmen .88, toe .90. *Hab.* Arctic regions; southward in winter. Kauai.

44. P. loba'tus[25] (LINN.). **Northern Phalerope.**

GENUS **CRYMO'PHILUS** VIEILLOT.

Summer female: Fore part of head deep plumbeous black; hind neck plain cinnamon and plumbeous; sides of head white; sides of neck and entire under parts vinous chestnut; general color of back sandy buff, streaked with black centres to the feathers; lesser wing coverts slaty blue with whitish edgings. *Male:* Similar to the female, but less brightly colored; the head sandy brown streaked with blackish like the back; a good deal of white on the under surface of the body and throat. *Male in winter:* Bluish grey above; wings more dusky than in summer, but still retain the white markings; head, neck and lower parts pure white, with the occiput and space about the eye dark plumbeous. *Young:* Top of head, hind neck, back and scapulars

[25] The only specimen in the Museum was one shot by Mr. A. F. Judd on Kauai during the winter of 1892–93. This seems to be the first record of *P. lobatus* appearing in Hawaii.

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dull black, the feathers edged with ochraceous; wing coverts, rump and upper tail coverts plumbeous. Length about 7.75, wing 5.00, tail 2.10, tarsus .80, culmen .80, toe .82. *Hab.* Northern portions of northern hemisphere. Hawaii, Maui.[26]

45. Crymo'philus fuleca'rius (LINN.). **Red Phalarope.**

FAMILY **RECURVIROS'TRIDÆ.**—STILTS AND AVOCETS.

Genus.

With the hind toe absent; toes with scarcely any web, and divided to the base; bill nearly straight.....(Page 26.) **Himan'topus.**

GENUS **HIMAN'TOPUS** BRISSON.

Under surface of the body white; head and neck behind black, with no complete white collar on the latter; forehead white; ear coverts and sides of face black; back of neck and upper parts, including wings, black with a deep gloss; tail light grey tipped with black. Length about 15.00, wing 8.75–9.50, tail 3.25–3.30, culmen 2.80–3.10, tarsus 4.75, middle toe 1.80. *Hab.* Hawaiian Islands.

Pl. XXV., 9429. **46. H. knud'seni** STEJN. **Hawaiian Stilt, Kukuluaeo.**

FAMILY **SCOLOPAC'IDÆ.**—SNIPES, SANDPIPERS, ETC.

Genera.

a. Back of tarsus with continuous row of transverse scutulæ (*i. e.*, square plates); bill straight. Ears situated decidedly posterior to the eye (not underneath it[27]); plumage varying with the seasons. (Sub-family *Tringinæ.*)

b. Hind toe present.

c. No web between the anterior toes; bill but slightly if at all widened at the tip; exposed culmen longer than the middle toe and claw....(Page 27.) **Trin'ga.**

cc. Middle toe united to one or both of the lateral toes by a membrane; tail not more than half as long as the wing.

d. Tail longer than the exposed culmen; wing more than 4.50; axillaries uniform greyish or dusky; no web between the middle and inner toe.

(Page 27.) **Heteracti'tis.**

dd. Tail shorter than the exposed culmen; wing more than 7.00; terminal portion of both mandibles smooth and hard.....(Page 27.) **Limo'sa.**

bb. Hind toe absent.....(Page 28.) **Cal'idris.**

aa. Back of tarsus covered with hexagonal scales. (Sub-family *Numinæ.*)

(Page 28.) **Nume'nius.**

[26] A specimen in fine winter plumage is in the collection made by Brother Matthias, on Maui, which is now in the St. Louis College cabinet, Honolulu. From this specimen the above description and measurements are taken. (See also Henshaw, Auk, XVII., p. 203.) Dr. Schauinsland lists this species from Laysan Island.

[27] Mr. Henshaw adds *Gallinago delicata* (Ord.), from Hawaii.

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GENUS **TRINGA** LINNÆUS.

Middle tail feathers longer and more pointed than the rest; tarsus longer than the middle toe and claw; exposed culmen not longer than the tarsus, and less than half as long as the tail (Sub-genus *Acto'dromas*); wing more than 4.50; rump and tail coverts plain brownish black; shaft of all the quills white for a portion of its length. *Adult male:* General color above sandy rufous streaked with black down the centre of the feathers; lesser wing coverts dull brown; primary coverts blackish; crown of head bright sandy rufous streaked with black; lores and a distinct eyebrow white with a narrower streak of blackish; under surface of body white; the chin unspotted; the throat and fore neck tinged with rufous and minutely spotted. *Female* similar. *Winter:* Much browner than the summer plumage without the rufous except on the head *Young:* With more rufous on the upper parts than the old birds. Length 7.75, wing 5.10, tail 2.10, culmen .90, tarsus 1.20, middle toe 1.10. *Hab.* Far north, breeding in Alaska, migrating south. Oahu,[28] Maui, Laysan.

47. T. acumina'ta[29] (HORSF.). **Sharp-tailed Sandpiper.**

GENUS **HETERACTI'TIS** STEJNEGER.

General color above uniform ash-greyish with slightly indicated lighter margins; nasal grooves more than half as long as the exposed culmen; lower back, rump and upper tail coverts purer grey; wing coverts like the back; lores blackish. *Winter:* Under surface of the body white with ash-grey shade over the fore neck and chest; sides of flanks and chest also ashy grey. *Female* similar. *Summer:* Above plain brownish gray varied with dusky; lower parts white tinged with grayish on the fore neck; fore neck streaked; rest of lower parts barred with dusky. *Young:* Above brownish grey, the feathers margined with buff or pale ochraceous and finely mottled transversely with greyish. Length 10.50–12.00, wing 6.40–6.75, tail 2.90–3.00, culmen 1.50–1.70, tarsus 1.25–1.32, toes 1.25–1.30. *Hab.* Pacific coast of America, southward, wide-ranging. Hawaiian Islands.

Pl. XXV., 9159. **48. H. incanus** (GMEL.). **Wandering Tatler, Ulili.**

GENUS **LIMO'SA** BRISSON.

Wing without white patch; with the tail distinctly barred; upper tail coverts white with brownish or dusky markings; under parts, head and neck plain cinnamon color; general color over the back blackish mottled with chestnut red; wing coverts greyish varied with dusky shaft streaks and whitish margins. *Winter:* Head, neck and lower parts whitish, darkest on the chest, streaked with dusky about the head and neck; breast and sides of body with a few shaft streaks and bars of brownish grey.

[28] The Museum's specimen of *T. acuminata* was taken by Mr. A. F. Judd in Moanalua valley near Honolulu. I have examined a specimen taken on Maui by Brother Matthias which is now in the St. Louis College cabinet. Dr. Schauinsland includes it in his list from Laysan.

[29] *Tringa americana*, Cass., is added by Dr. Schauinsland's list of birds from Laysan; also *T. maculata*, Vieill, from Hawaii (Hensh.).

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Female: Similar to male but larger. *Young:* Above, including wing coverts, buffy greyish or dull clay color irregularly varied with dusky; lower parts dull buffy whitish shaded across chest with deeper greyish buff. Length 14.60–16.00, wing 8.25–9.15, culmen 3.17–4.70, tarsus 2.00–2.45, middle toe 1.10–1.33..... *Hab.* Coasts of Eastern Asia and across to Alaska, migrating south in winter to New Zealand and Australia; Lower California, casual in winter (Ridgway). Kauai.[30]

49. L. lappon'ica bau'eri (NAUM.). **Pacific Godwit.**

GENUS **CAL'IDRIS** CUVIER.

Winter: General color above light ashy grey with more or less distinct hoary edges to the feathers and blackish shaft stripes; under parts white. *Summer:* Differs from the winter in being mottled and not uniform; greater wing coverts broadly tipped with white; above light rusty, mottled and spotted with blackish on the feathers; head, neck and chest light rusty. *Spring:* Above light greyish coarsely spotted with black, streaks of black on the neck. *Young:* Similar to winter adult but not so uniform above. Only seen in winter plumage in Hawaii(?). Length about 8.00, wing 4.80–4.90, tail 2.25–2.30, tarsus .95, middle toe .73, culmen .90–1.00. *Hab.* Nearly cosmopolitan. Hawaiian Islands.

50. C. arena'ria (LINN.). **Sanderling, Hunakai.**

GENUS **NUME'NIUS** BRISSON.

Feathers of the thighs terminating in long bristle-like points; quills with whitish or rufous on the inner edge; a central longitudinal pale band down the crown, with the sides of the crown blackish brown forming a broad band down the sides of the latter; auxilliaries pale cinnamon barred with wide stripes of dark brown; upper parts sooty brown and buff; tail coverts uniform cinnamon buff; lower parts dull buff; cheeks, neck and breast streaked with brown. *Female* similar. Length about 17.00, wing 9.00–9.25, tail 3.75, culmen 2.95–3.25, tarsus 2.15–2.35. *Hab.* Most of the islands of the Pacific. Hawaiian Islands.

Pl. XXV., 9752. **51. N. tahitien'sis** (GMEL.). **Bristle-thighed Curlew, Kioea.**

FAMILY **CHARADRI'IDÆ.**—PLOVERS.

Genus.

With no spur and no facial wattles; wing less than 8.00; plumage without metallic tint; head not crested; no hind toe.....(Page 28.) **Charad'rius.**

GENUS **CHARAD'RIUS** LINNÆUS.

No hind toe. *Adult summer:* General color above mottled with black, golden and ashy chin, throat and lower parts dull dusky black; a frontal band and long eye-

[30] The specimen from which the above description was taken is in the possession of Mr. Francis Gay and was secured by him on the island of Kaua The measurements are, length 17.00, wing 9.00, tail 3.00, culmen 4.10, tarsus 2.25, middle toe 1.50 (?). A fine winter specimen is in St. Louis College cabinet, Dr. Schauinsland also records *Limosa novæ-zealandiæ*, Salv,. from Laysan.

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brow white or buffy white; wing feathers black with white shafts. *Adult winter:* With no black on under parts, which are whitish on the throat and belly and light brownish streaked with grey elsewhere, more streaks on the chest; usually less yellow above than in summer. *Young:* Similar to adults but with more golden above; crown blacker. Length 9.85–10.00, wing 6.35–6.65, tail 2.65–2.90, culmen .85–1.00, tarsus 1.60–1.92 (1.70), toe 1.20–1.32, depth of bill .25. *Hab.* Breeding in Northern Asia and Alaska, southward to Polynesia. Hawaiian Islands. The following table of measurements is taken from specimens in the Museum series:

	Male.	Male.	Male.	Male.	Male.	Female.	Female.	Female.
Length	9.90	9.85	10.00	9.75	10.00	10.00	10.00	10.00
Wing	6.65	6.40	6.50	6.55	6.35	6.45	6.75	6.50
Tail	2.90	2.80	2.80	2.72	2.80	2.65	2.80	2.75
Culmen	.98	.98	1.00	.90	1.00	.85	.90	.97
Tarsus	1.85	1.92	1.70	1.60	1.70	1.70	1.76	1.75
Toe	1.25	1.30	1.25	1.20	1.32	1.25	1.30	1.25
Depth of bill	.25	.26	.25	.25	.26	.25	.26	.26

52. C. domin'icus fulvus[31] (GMEL.). **Pacific Golden Plover, Kolea.**

Pl. XXV., 9397, 9897.

FAMILY **APHRIZ'IDÆ.**—SURF BIRDS AND TURNSTONES.

Genus.

Nasal grooves not more than half the length of the upper mandible; tail slightly rounded; terminal half of the bill pointed.....(Page 29.) **Arena'ria.**

GENUS **ARENA'RIA** BRISSON.

Head white and streaked with black, or head blackish brown; throat white, followed by a broad black band. *Fall adult male:* General color above black mixed with chestnut or partly chestnut feathers; entire rump pure white; upper tail coverts black, longer ones white; quills black with white shafts; crown of head and hind neck white; lores white; sides of neck, fore neck and breast black; throat white; abdomen white. *Female:* Duller all over and with less chestnut. *Winter:* Above nearly uniform dusky brown, edges of feathers ashy brown; head uniform brown like the back; hind neck and side of neck ashy mottled with dusky centres. *Young:* General color above dusky brown; throat and under surface of body white. Length about 8.00, wing 5.60–5.95, tail 2.40–2.50, culmen .88–.90, tarsus .95–1.05, toe 1.05, depth of beak .30. *Hab.* Cosmopolitan. Hawaiian Islands.

Pl. XXV., 8726, 9174. **53. A. inter'pres**[32] (LINN.). **Turnstone, Akekeke.**

[31] Mr. Henshaw adds *Squatarola squatarola* (Linn.) from Hawaii. (Auk, XVII., p. 202.

[32] It is probable that *A. interpres* (Linn.) and *A. melanocephala* (Vig.) both visit the islands. However, I have seen no specimens of the latter that have been taken in the group.

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Order GALLINÆ.—Gallinaceous Birds.

Families.

Hind toe rather small and short, less than half the length of the outer toe and inserted above the level of the middle toe. (Sub-order *Phasiani.*)

a. Head entirely feathered, tarsus without spur....(Page 30.) **Tetraon'idæ.**
aa. Head partly naked, tarsus with spur.....(Page 30.) **Phasian'idæ.**

Family **TETRAON'IDÆ.**—Quails, Etc.

Genus.

Tarsi and nasal fossæ naked; wings less than 6.00 (Sub-family *Perdicinæ*); cutting edge of lower mandible somewhat serrate; first wing quill shorter than the seventh; tail shorter than the wing; wing not more than 5.50; plumage much varied; tail more than two-thirds the length of wing; crest lengthened and distinct from the feathers of the crown.....(Page 30.) **Lophor'tyx.**

Genus **LOPHOR'TYX** Bonaparte.

Crest black; throat uniform black in the adult males; flanks olive brown or greyish streaked with chestnut. *Male:* Belly with black scale-like markings and a central patch of chestnut. *Female:* Prevailing color smoky greyish or brownish. *Young:* Above finely mottled brownish; throat and abdomen dull whitish. Length about 9.50, wing 4.35–4.70, tail 4.10–4.70, tarsus 1.20–1.25. *Hab.* California and Oregon. Hawaiian Islands; introduced.

54. L. californ'ica (Shaw). **California Partridge.**

Family **PHASIAN'IDÆ.**—Pheasants.

Genus.

Head feathered except about the eyes; tail lengthened and graduated, the feathers tapering to a point; sexes different. (Sub-family *Phasininæ.*)
(Page 30.) **Phasia'nus.**

Genus **PHASIA'NUS** Linnæus.

a. Under parts fiery copper chestnut. *Male:* A white ring about the middle of the neck; the neck metallic green; the breast with metallic coppery and purple reflections. *Female:* With all the tail feathers barred with blackish and dirty white on a brownish ground. Length 20.00 in the female to 30.00 in the males; wing 8.50–10.50, tail 11.00–20.00. *Hab.* China. Hawaiian Islands; introduced.

55. P. torqua'tus Gmel. **Ring-neck Pheasant.**

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aa. Under parts dark green; no white ring about the neck; throat and side of the neck with a purplish gloss; top of the head bronze green; the lower neck and mantle dark green varied with buff lines which follow the shape of the feathers; lesser wing coverts greenish slate; larger wing coverts as well as the lower feathers of the mantle with bright ferric ochraceous markings; rump greenish. *Female:* Feathers of the mantle almost entirely black in the middle, with sometimes a shaft stripe of rufous and green tip to the feathers; feathers to the mantle and nape indistinctly tipped with dark green; under parts light buff; all the feathers of the chest, breast, sides and flanks strongly marked with black. Length 24.00–29.00, wing 8.20–9.65, tail 10.00–14.00, tarsus 2.20–2.70, toe 2.50. *Hab.* Japanese Islands. Oahu; introduced.

56. P. versi'color[33] VIEILL. **Japanese Pheasant.**

Order COLUMBÆ.—Pigeons.

Family.

Tarsus almost as long or longer than the middle toe; tail feathers twelve or more. (Page 31.) **Peristeridæ.**

FAMILY **PERISTERIDÆ.**—GROUND PIGEONS, ETC.

Genus.

Without metallic spots on the wings; tail rather broad; tarsus naked on the upper parts; neck with a dark collar. (Sub-family *Turturinæ.*) Same characters for the genus.....(Page 31.) **Turtur.**

GENUS **TURTUR** SELBY.

Feathers of the hind neck bifurcated (forked at the tip); black with white terminal spots (Sub-genus *Spilopelia*); under tail coverts grey; upper parts, back, rump, etc., light brown edged with lighter brown; top of head blue grey; back of neck vinous; lower parts rich vinous, lightest on the chin and abdomen; outer wing coverts lead-grey; outer pair of tail feathers black tipped with broad white band. *Female* similar. *Young:* Paler and duller all over. Length 12.50–13.00, wing 6.00–6.25, tail 5.00–5.50, tarsus .90–1.00, toe 1.20. *Hab.* China. Hawaiian Islands; introduced.

57. T. chinen'sis (SCOP.). **Chinese Turtle Dove.**

[33] Hybrids between the two species of pheasants here given frequently occur. The numerous attempts to introduce game birds into the islands have met with varied success, so that "wild" turkey, chickens, guinea fowls, pea fowls, etc., are not infrequently met with.

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Order RAPTORES.—Birds of Prey.

Families.

Head entirely feathered; no web between the inner and middle toe; hind toe with large sharp claw.

a. Eyes lateral, not surrounded by disks of radiating feathers; outer toe not reversible. (Sub-order *Falcones.*).....(Page 32.) **Falcon'idæ.**

aa. Eyes surrounded by disks of radiating feathers; both eyes directed forward; cere concealed by loral and frontal feathers (Sub-order *Striges*); facial disks distinct and extending as far above the eye as below it; inner toe decidedly shorter than the outer one; first quill shorter than the third.....(Page 33.) **Bubon'idæ.**

Family **FALCON'IDÆ.**—Falcons, Hawks, Etc.

Genera.

Nostrils not circular, nor linear and oblique; with the upper end of the nasal opening the anterior one (Sub-family *Accipitrinæ*); tail not forked; front of tarsus covered with large transverse scutulæ; claws grooved beneath; cutting edge of upper mandible not notched; tip of upper mandible produced into a conspicuous hook.

a. Face encircled by a ruff of short stiffened feathers, as in the owls.

(Page 32.) **Circus.**

aa. Face not encircled by a ruff; tail not more than two-thirds the length of the wing; primaries exceeding the secondaries by much more than the length of the tarsus in front; wings more than four times as long as the tarsus.....(Page 33.) **Buteo.**

Genus **CIRCUS** Lacépède.

Male: Above dull blue-grey, darker and inclined to brownish on the head, back and scapulars; the neck somewhat mottled with buffy white; facial ruff ashy grey; chin whitish; throat, sides of neck and breast dull greyish; rest of under parts white; tail bluish grey; upper tail coverts white. *Female:* Above dusky brown; head and neck streaked; the lesser wing coverts spotted; feathers of rump edged with rusty; facial ruff buffy white streaked with dark brown; tail ashy grey with five bars of dark brown, the interspaces more or less rufous; under surface of body buffy white with broad streaks of brown on the breast, thighs and abdomen. *Young:* Above ashy brown or blackish brown with rufous margins to the feathers; wing coverts spotted with deep rusty; ear coverts uniform bright dark brown; feathers of the disks browner; lower parts rich rusty ochraceous, paler posteriorly. Length 19.50–24.00, wing 12.90–16.00,

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tail 8.80–10.50, tarsus 2.85–3.25, middle toe 1.20–1.55. *Hab.* Whole of North America, southward; accidental in Hawaiian Islands. (No specimens in the Museum.)

58. C. hudson'ius (LINN.). **Marsh Hawk.**

GENUS **BUTEO** CUVIER.

Upper parts, back, head and upper tail coverts blackish brown; secondaries and wing coverts like the back; all with paler margins, and with some tawny rusty; throat white; sides of breast brown mottled with white; black shafts to all the dark feathers; abdomen, tibia and under tail coverts white with faint brownish markings; quills blackish above; from the notch to the base of inner web white with faint brownish bands varying in size and extent; tail, general color brownish with bands of smoky brown and dull ash-grey. *Female:* Larger and similar (one specimen shows indistinct bands of brownish and tawny on the wing coverts and back). *Young:* Darker above, more rusty edgings to the feathers of the sides and back of the neck; throat with narrow shaft stripes; breast and under parts with more brown than white; thighs brown with rusty; under tail coverts whitish with cross bars of brown slightly edged with ochraceous rusty. Length about 15.50. Measurements taken from three specimens: Wing 9.50, 10.60, 11.75; tail 5.50, 5.60, 6.40; tarsus 2.60, 2.30, 2.60; culmen 1.10, 1.25, 1.30; toe 1.90, 1.75, 2.10. (The last set of measurements are from the female.) *Hab.* Hawaii.

Pl. XXVI., 5521. **59. B. solita'rius**[34] PEALE. **Hawaiian Hawk, Io.**

FAMILY **BUBONI'DÆ.**—OWLS.

Genus.

Characters as given for the family.....(Page 33.) **Asio.**

GENUS **A'SIO** BRISSON.

Light bands on quills less than ten in number; under surface of quills barred across with brown; tips entirely brown; face more or less fulvescent with brownish black; ear tufts short; ground color varying in individuals from tawny ochraceous to buffy white relieved by dark brown stripes; wings mottled with dusky and ochraceous; tail ochraceous and buffy; outer feathers lighter. *Young:* Above dark sepia brown, the feathers broadly tipped with buff; face uniform brownish black; lower parts wholly plain dull buffy tinged with smoky greyish anteriorly. *Hab.* Hawaiian Islands. The following measurements seem to justify the separation sub-specifically of the Hawaiian form from the larger North American bird:

	Sex.	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Toe.*	*Culmen.*
B. P. B. Museum No. 9,835.	♂	13.25	11.15	5.40	1.35	1.60	1.10
No. 10,067.	♀	14.00	11.80	5.50	1.35	1.58	1.12
No. 1,284.	—	14.25	11.20	5.55	1.38	1.55	1.08
No. 9,272.	♂	14.00	11.50	5.45	1.36	1.55	1.10

Pl. XXVI., 9835. **60. A. accipitri'nus sandvicen'sis**[35] (BLOX.). **Hawaiian Owl, Pueo.**

[34] There are some uncertain references to "*Pandion solitarius*" which are with difficulty reconciled with the habits of the species given above. A fish-hawk (*Pandion*) may yet be taken in the group.

[35] To correspond with the form usually adopted *sandwichensis* is changed to *sandvicensis*.

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Order PASSERES.—Perching Birds.

Families.

Tarsus compressed behind, forming a comparatively sharp edge, or else hind claw longer than its digit and straight, the enveloping membrane (*i. e.*, tarsal sheath) divided into not more than three longitudinal segments which may be either cut up into transverse segments or fused into continuous plates. (Sub-order *Oscines.*)

a. Posterior half of the tarsus not compressed but rounded and divided into distinct segments like the anterior half..... (Page 35.) **Alau'didæ.**

aa. Posterior half of the tarsus compressed with the lateral plates forming a sharp ridge.

b. No bastard primary (*i. e.*, the first primary obsolete), the outer primary falling short of the wing by less than the length of the hind toe without the claw; bill of various forms but with a well developed operculum; tongue a more or less modified tubular brush. A very heterogeneous family embracing the greater part of the Hawaiian passerine avi-fauna.....(Page 39.) **Drepan'ididæ.**

bb. Tenth or outer primary present, but varying in length.

c. Primaries apparently only nine, the tenth being exceedingly rudimentary; tip of the bill not hooked; bill straight and cone-shaped. Bird sparrow-like.

d. Wing less than 2.40; nostrils placed high on the bill nearer the culmen than the tomium.....(Page 39.) **Ploce'idæ.**

dd. Wing more than 2.48; bill notched and with a few bristles at the gape; true sparrows.....(Page 38.) **Fringill'idæ.**

cc. Primaries obviously ten, or else the bill hooked; tarsus longer than the middle toe with claw.

e. Tarsus more or less distinctly scutulate in front.

f. Tail feathers normal, but not especially long; nasal feathers erect or inclined backward; nasal bristles either present or wanting.

g. No nasal bristles; nasal feathers inclined backward somewhat; first primary minute, not reaching to the tip of the wing coverts; white patch on the wing at base of primaries.....(Page 37.) **Stur'nidæ.**

gg. Nasal bristles present.

h. Large birds; wing more than 4.00.

(Page 35.) **Cor'vidæ.**

hh. Small birds; wing less than 4.00.

i. First primary not over .30; bill slender and notched near the tip; nasal openings not pronounced....(Page 58.) **Sylvi'idæ.**

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ii. First primary more than a third the length of the second; bill rather broad and flat; nasal bristles extending forward for half the length of the culmen.....(Page 36.) **Muscicap'idæ.**

ff. Tail feathers long, graduated; tail longer than the wing; nostrils basal in an unossified groove; first primary about half the length of the second; with or without auxiliary plumes.....(Page 56.) **Meliphag'idæ.**

ee. Tarsi not divided into scutulæ in front except at extreme lower portion; with few rectal bristles.

j. Wing less than 3.00; small brown birds; young not spotted (See **i.**, page 34).....(Page 58.) **Sylvi'idæ.**

jj. Wing more than 3.00; the young spotted.....(Page 59.) **Tur'didæ.**

FAMILY **ALAU'DIDÆ.**—LARKS.

Genus.

Wing falling short of the tail by more than the length of the tarsus; hind claw very long; culmen shorter than the middle toe; first primary rudimentary; plumage mainly dull brownish.....(Page 35.) **Alau'da.**

GENUS **ALAU'DA** LINNÆUS.

The feathers with blackish centres, everywhere producing a streaked appearance; the scapulars and lower mantle with greyish edges to the feathers; chest tawny buff streaked with black; outer tail feathers white with some dusky along the inner web. *Winter:* Plumage more tawny. *Young:* More tawny than the winter adults, with more white above and black streaks changing to subterminal spots of dark brown. Length about 7.50, wing 4.35–4.55, tail 2.90–3.05, culmen .45–.50, tarsus .95. *Hab.* Europe and Asia. Hawaiian Islands; introduced.

61. A. arven'sis LINN. **Skylark.**

FAMILY **COR'VIDÆ.**—CROWS, ETC.

Genus.

Bill without a distinct subterminal notch at the tip; hind toe strong; wing falling short of the tip of the tail by less than the length of the tarsus; nostrils concealed by bristles; first primary long as secondaries (Sub-family *Corvinæ*); tarsus longer than culmen.....(Page 35.) **Cor'vus.**

GENUS **COR'VUS** LINNÆUS.

Head deep brown or blackish; back lightest on the tertiaries and secondaries, and grey-brown on the primaries; rump and tail blackish brown uniform with mantle; primary shafts brown above, below more whitish brown. Length 18.00–20.00, wing 13.00, tail 7.75–8.50, culmen 2.20–2.40, depth of bill 1.00–1.10, tarsus 2.50–2.65, toe 2.10–2.30. *Hab.* Hawaii.

Pl. XXVI., 6599. **62. C. hawaiien'sis** PEALE. **Hawaiian Crow, Alalá.**

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FAMILY **MUSCICAP'IDÆ.**—FLY-CATCHERS.

Genus.

Bill broad, soft, rather flat, slightly hooked at the tip, and furnished with numerous rectal bristles which reach beyond the middle of culmen; culmen keeled; wing falling short of the end of the tail by about the length of the tarsus; wing longer than the tail; bill at base not as broad as the length of the hind toe without the claw; the second primary a half inch shorter than the third. Peculiar to the Hawaiian Islands.

(Page 36.) **Chasiem'pis.**

GENUS **CHASIEM'PIS** CABANIS.

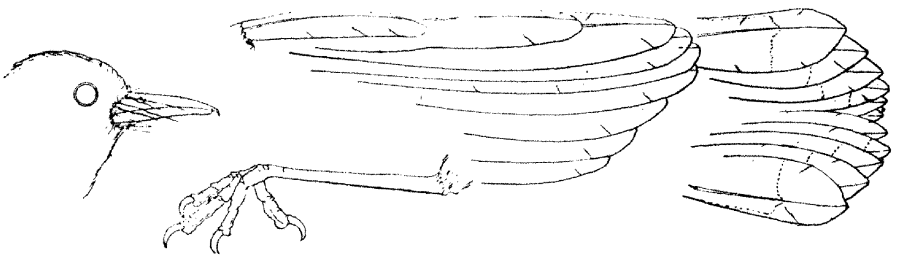

FIG. 1. C. SANDVICENSIS.

a. *Young of all species:* Wing coverts spotted with tawny ochraceous; throat ochraceous; base of lower mandible lighter without black or white on the throat.

b. Browner above, ochraceous of throat and tail coverts deeper; head not so ochraceous. (See description of adult *C. sandvicensis.*)

bb. Lighter, more ochraceous above, throat and upper tail coverts rusty ochraceous. (See description of adult *C. gayi* and *C. sclateri.*)

aa. *Adult of all species:* Wing coverts spotted with white; black or white or both on the throat; lower mandible dark; tail coverts white.

c. Above bluish grey. *Adult:* Above uniform dark smoky grey; upper tail coverts pure white; wing coverts blackish, with greater and lesser coverts tipped with white forming two fairly distinct bars across the wing; quills blackish with grayish fulvous edges tipped with white; lores and superciliary stripe whitish or buffy white; centre of throat white surrounded by buffy and buffy grey feathers, forming a more or less distinct pectoral girdle; sides of the body greyish white with wash of rusty; abdomen and under tail coverts white; white on outer web of tail feathers narrow and extending along the edge for the greater part of its length; white tip about .35 broad. *Young:* Deep tawny buff or ochraceous about the rump, head and neck; under tail coverts tawny; wing bands rusty. Length 5.25–5.50, wing 2.55–2.95, tail 2.35–2.60, culmen .45–.50, depth of bill .16, width .22, tarsus .80–.89, toe .65. *Hab.* Kauai.

Pl. XXVII., 6657, 9410. **63. C. scla'teri** RIDGW. **Apekepeke.**

cc. Above brownish.

d. White tips to the outer tail feathers, usually longer than .50; white tip and outer edging of the secondaries neither wide nor prolonged. *Adult:*

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Above brown tinged with rufous; upper tail coverts white; forehead, lores and superciliary stripe white; wing coverts black with white spots; primary coverts blackish; primaries brown with rusty or buffy white edges; feathers of the throat black tipped with white, which is conspicuous in older birds; chest and sides of the body reddish brown, sometimes with white tips; abdomen and under tail coverts pure white; outer edge of outer pair of tail feathers whitish for most of their length; inner web white for at least .40. *Intermediate plumage:* Forehead, lores and superciliary stripe rusty white; upper parts similar to adult, usually more rusty; upper tail coverts white with ochraceous tinge; wings as above; throat white, followed by a sooty black patch, and this in turn by rufous brown as in adult; rest of lower parts similar to adult. *Young:* Tawny ochraceous brown above; head tawny with darker centres to the feathers; upper tail coverts ochraceous; primaries and tail feathers showing ochraceous; wing coverts brown tipped with ochraceous; under parts rusty, buff and grey passing to whitish grey on the abdomen. Length 5.50–5.75, wing 2.70–2.75, tail 2.40–2.65, culmen .47–.53, depth of bill .20, width .18, tarsus .90, toe .63. *Hab.* Hawaii.

Pl. XXVII., 9923, 9924. **64. C. sandvicen'sis**[36] (GMEL.). **Hawaii Elepaio.**

dd. White tips to outer pair of tail feathers usually less than .50; white tips and edgings to the secondaries quite pronounced; above brownish (feathers with bluish bases) washed with tawny ochraceous, especially about the head; tail coverts white; wing coverts brownish black forming a well defined bar; lesser coverts tipped less regularly with white; primaries brown with buff edges; forehead rusty ochraceous; lores and about the eyes white; chin white; throat black with more or less white tips (not so conspicuous as in *sandvicensis*); breast with some reddish brown; abdomen white. *Intermediate plumage:* Similar to young, but showing brownish black in the throat, and more or less white in the wing and tip of the tail. *Young:* Above, tawny ochraceous brown, most ochraceous on the sides and back of the neck; upper tail coverts tawny ochraceous; forehead, lores, chin, throat and chest tawny ochraceous; abdomen white; under tail coverts tawny; wing coverts and primaries brown with ochraceous edges, larger wing coverts sometimes showing white tips forming a less conspicuous bar than in adults. Length 5.50–6.00, wing 2.55–2.65, tail 2.50–2.55, culmen .40–.45, tarsus .95–1.00, toe .60. *Hab.* Oahu.

Pl. XXVII., 9252, 9258, 9255, 9259, 9260, 9407. **65. C. gayi** WILSON. **Oahu Elepaio.**

FAMILY **STUR'NIDÆ.**—STARLINGS, MINAS, ETC.

Genus.

Hind claw stronger than the claw of the middle toe; in prepared skins the feet reach almost to the end of the tail; bill somewhat curved; culmen less than the tarsus in length.....(Page 38.) **Acridothe'res.**

[36] With the material at hand it is impossible to separate the two forms which are supposed to occur on the island of Hawaii.

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GENUS **ACRIDOTHE'RES** VIEILLOT.

With a bare patch of yellow skin below and behind the eye; lower mandible black at the base; with white on the base of primaries forming a speculum; no black on breast and abdomen; above vinous brown with an ashy shade, as is also the breast and sides of the body; abdomen and under tail coverts white; head and neck blackish. *Female* similar. Length 9.50, wing 5.50, tail 3.45, tarsus 1.40. *Hab.* Indian Peninsula. Hawaiian Islands; introduced.

66. A. tristis (LINN.). **False Mina.**

FAMILY **FRINGILLI'IDÆ.**—SPARROWS, FINCHES, ETC.

Genera.

Depth of bill at base less than the length of hind toe with claw, and less than two-thirds the length of the tarsus.

a. Gonys slightly convex; a light brownish spot on speculum at base of quills. (Page 38.) **Passer.**

aa. Gonys not appreciably convex; no light spot or speculum at base of quills; wing less than five times as long as the tarsus; first quill decidedly longer than the fourth; depth of bill at base about equal to the length of culmen. (Page 38.) **Carpod'acus.**

GENUS **PASSER** BRISSON.

Brownish above; the back streaked with black; wing with two white bands; under parts pale greyish or greyish white. *Male:* With black throat continued over the chest; ear coverts dull grey; top of head greyish with a large patch of bright chestnut on the sides. *Female:* With the throat not black; back streaked or mottled with blackish; a pale superciliary stripe; cheeks dingy brown like the ear coverts; browner than the male. *Young:* Both sexes resemble the adult female but are whiter below, especially on the throat. Length 5.50–6.25, wing 2.90–3.00, tail 2.45–2.50. *Hab.* Europe, America, etc. Hawaiian Islands; introduced; common.

67. P. domesticus LINN. **European House Sparrow.**

GENUS **CARPOD'ACUS** KAUP.

Sides of body streaked or always with well defined shaft lines of brown, and with a distinct eyebrow; tail not decidedly shorter than wing; not distinctly emarginated (Sub-genus *Burrica*); crown of head not broadly streaked; abdomen ashy white streaked with brown; general color above light ashy brown slightly streaked with darker brown. *Male:* Rump, lores, forehead, throat and breast crimson. *Female:* General color above brown slightly mottled with dusky centres to the feathers; upper tail coverts like the back; crown similar and more or less mottled; lores ashy white; under surface white broadly streaked with dusky brown. Length about 5.25–5.50,

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wing 3.10, tail 2.35, culmen .40, depth of bill .30, tarsus .75, toe .50. *Hab.* Western part of North America. Hawaiian Islands; introduced.

68. C. mexica'nus obscu'rus McCALL. **House Finch, "Rice Bird."**

FAMILY **PLOCEIDÆ**.—WEAVER BIRDS.

Genus.

The first primary short, not longer than the primary coverts (Sub-family *Viduinæ*); tail about equal to the wing; centre feathers somewhat produced and pointed, but the tail itself wedge-shaped and not greatly graduated; bill swollen and rounded; culmen strongly arched; tail moderately long, never exceeding the wing by as much as the tarsus with the middle toe and claw.....(Page 39.) **Mu'nia.**

GENUS **MU'NIA** HODGSON.

Legs dark; under tail coverts buffy white; throat deep chestnut; sides of body oculated with black and white spots; tail from above greyish olive yellow; rump feathers plain with lighter edges; general color above warm chocolate brown with narrow whitish shaft lines, the lower back waved with dusky brown cross bars; quills dusky brown. *Adult female* similar to the male in color. *Young:* Nearly uniform reddish brown; upper tail coverts more yellowish brown; wing coverts like the back; crown of head and sides of face like the back; under parts of the body deep sandy brown; feet and bill paler. Length 4.40–4.55, culmen .45, wing 2.15–2.30, tail 1.60–1.80, tarsus .60. *Hab.* Malayan Peninsula. Hawaii, Maui, Oahu; introduced.

69. M. niso'ria (TEMM.). **Chinese Sparrow.**

FAMILY **DREPAN'IDIDÆ**.—HONEY-SUCKERS.

Genera.

a. *Bill very strong*, deep and hawfinch-like in form; depth of bill at base about equal to (never less than) hind toe without the claw; culmen not longer than hind toe with the claw, and never shorter than .50. Length never less than 5.15.

b. Upper mandible longer than the lower by at least .10; both gonys and culmen strongly curved; plumage in adult males yellow on the throat.

c. Wing not exceeding 3.10; culmen strongly curved (parrot-like) and exceeding the lower mandible by the length of the hind claw; yellow super-loral stripe. (Page 53.) **Pseudones'tor.**

cc. Wing more than 3.10; culmen curved but not exceeding the lower mandible by more than the length of the hind claw (except rarely in *Psittacirostra*).

d. Back without any back shaft streaks; head yellow; upper mandible light colored.

e. Head, neck and chest bright gamboge yellow; primaries edged externally with yellow olive.....(Page 54.) **Loxioi'des.**

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ee. Head and neck in the male yellow, female olive green; edge of primaries slightly yellow olive; feet light brown (in the skin).

(Page 53.) **Psittaciros'tra.**

dd. Back with more or less distinct blackish or brownish shaft streaks; upper mandible horn-color; feet black or bluish black.

(Page 54.) **Telespi'za.**

bb. Upper mandible exceeding the lower by not more than .10; bill very wide and deep; depth not less than .58, and width not less than .38.

f. Wing more than 4.00; bill bluish grey; gonys straight or very slightly decurved.....(Page 55.) **Rhodacan'this.**

ff. Wing less than 4.00; bill dull flesh color and very thick and clumsy; gonys curved.....(Page 56.) **Chlor'idops.**

aa. Bill of various forms but never deeper nor broader than .30; or, if so, very long and much decurved.

g. Culmen, cutting edge of mandibles and gonys all perceptibly decurved, except in *Heterorhynchus wilsoni* where the gonys is straight (where curve of bill is questionable, culmen more than .50).

h. Culmen very long and remarkably curved; culmen never less (usually much more) than .70.

i. Upper mandible at least one-third its length longer than the lower mandible; color never red or black.

(Page 51.) **Heterorhyn'chus.**

ii. Upper mandible not one-third longer than the lower mandible; tip of the wings falling short of the tip of the tail (in the skin) by less than the length of the tarsus.

j. Bill light vermilion (becoming decidedly paler in old skins); primaries and tail feathers black. (Page 42.) **Vestia'ria.**

jj. Bill for the most part black or blackish brown; lores black or brownish black.

k. Plumage chiefly olive; primaries never edged or tipped with whitish; bill sickle-like. (Page 50.) **Hemigna'thus.**

kk. Plumage chiefly black; primaries edged or tipped with whitish.

l. With yellow feathers over the rump in adults; under tail coverts elongated and loose-webbed; bill less curved.

(Page 41.) **Drep'anis.**

ll. With no yellow in the plumage at any age; bill much stronger and much more curved; under tail coverts normal.....(Page 42.) **Drepanoram'phus.**

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hh. Culmen not very long nor remarkably curved; both of the mandibles of practically the same length.

m. With a more or less prominent crest; length more than 6.50.....(Page 43.) **Palme'ria.**

mm. Without crest; adult birds either crimson or yellowish olive; length less than 6.50.

n. General color crimson, or with more or less red cast to the plumage; bill and feet black or blackish. (Page 43.) **Himati'one.**

nn. General color yellowish olive or olive grey; upper mandible brown or bluish slate at the base.

o. The bill but slightly curved; culmen more than .75; wing more than 2.95; bill bluish slate. (Page 46.) **Viridon'ia.**

oo. The bill curved; culmen less than .75; wing less than 2.95; upper mandible brown. (Page 44.) **Chlorodrep'anis.**

gg. Bill practically straight, or where questionable less than .50; wing less than 3.40.

p. Bill bluish horn at the base (finch-like), sometimes slightly crossed at the tip; feet black or blackish.

q. Lores not black; neck above and below nearly uniform in color; crown never gamboge yellow. (Page 48.) **Lox'ops.**

qq. Lores black; color of neck above and below different; crown gamboge yellow in adults. (Page 48.) **Chrysomit'ridops.**[37]

pp. Bills of various forms, but not bluish horn at the base; feet brown or pinkish in life.

r. Breast, wings and tail black, with red on under parts; length 5.50.....(Page 44.) **Cir'idops.**

rr. The breast, wing and tail not black; no red in the plumage; length less than 5.50.

s. Larger; the wing more than 2.30; outer primary (first primary wanting) as short or shorter than the fifth from the outer.....(Page 46.) **Oreomy'za.**

ss. Smaller; wing less than 2.30; outer primary equal to the fifth from the outer; bill slender, very slightly decurved; never more than .55.....(Page 46.) **Rothschild'ia.**[38]

GENUS **DREP'ANIS** TEMMINCK.

With yellow on the rump and upper tail coverts; both mandibles practically the same length and strongly curved; culmen more than equal to the tarsus in length;

[37] Included under the genus *Loxops;* see page 48.

[38] United with the genus *Chlorodrepanis*, the single species thereby becoming *Chlorodrepanis parva* (Stejn.).

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body, both above and below, fine deep black; rump, upper tail coverts, under tail coverts, thighs, lesser wing coverts and margin of the wing fine rich yellow, "crocus yellow" (Wilson); primary coverts white; tail feathers blackish, showing a little dull white for .50 along the shaft of the outer pair; primaries black with the outer edge, for its distal third, white; secondaries black tipped with white. *Sexes and young:* Length about 8.00, wing 4.00–4.15, tail 2.65–2.90, chord of culmen 1.62–1.70, depth of bill .30, width .30, tarsus 1.15, toe .75. *Hab.* Hawaii.

70. D. paci'fica (GMEL.). **Mamo.**

GENUS **DREPANORHAM'PHUS** ROTHSCHILD.

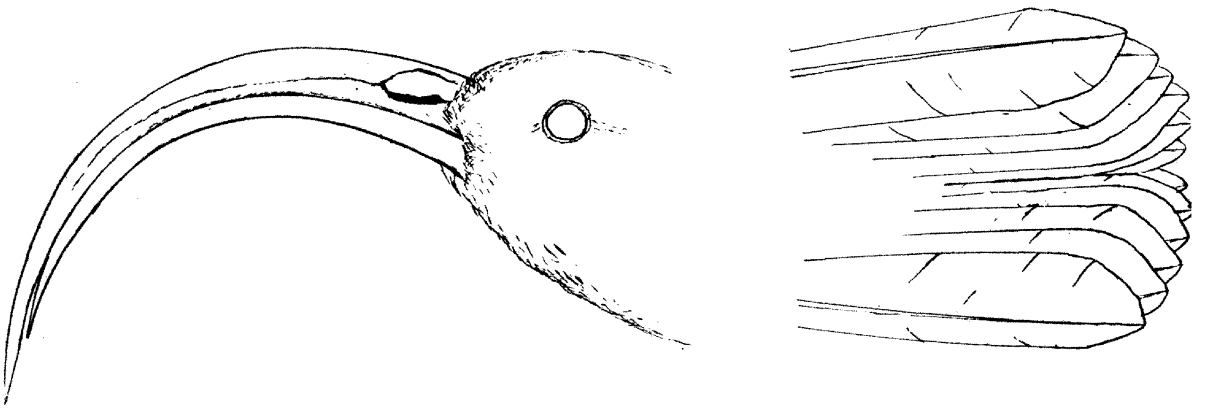

FIG. 2. D. FUNEREA.

With the upper and lower parts fine deep black, with no yellow on the rump; base of the upper mandible yellow or whitish; tail and inner edge of primaries deep black; outer edge of primaries smoky black at base, passing to whitish and forming a white conspicuous patch. *Female:* Similar, but with a shorter bill. Length about 8.00, wing 3.90–4.00, tail 2.55–2.80, chord of culmen 1.85–2.15, depth .32, tarsus 1.10–1.20, toe 1.00. *Hab.* Molokai.

Pl. XXVII., 6696.

71. D. fune'rea[39] (NEWTON). **Perkins' Mamo.**

GENUS **VESTIA'RIA** FLEMING.

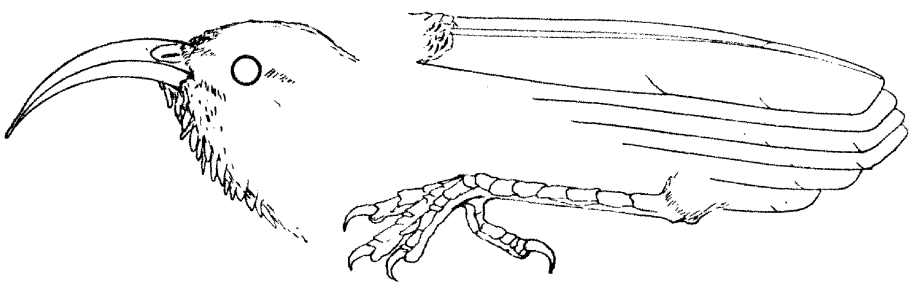

FIG. 3. V. COCCINEA.

Bill curved; about the same length as head; bill and feet vermilion in life, drying whitish; general color uniform scarlet vermilion including scapulars and lesser wing

[39] I take pleasure in adopting the new generic name for *D. funerea* (Newton) proposed by the Hon. Walter Rothschild in his "Avifauna of Laysan, etc." (Part III., p. 163). While it is unfortunate that the single example of this genus could not have been left as a species of the old and well known genus *Drepanis*, the facts are the form differs from it sufficiently to warrant the change.

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coverts; tertiaries tipped with white; wing and tail feathers deep black. *Female* similar. *Young:* All the vermilion parts grey, with some greenish and gallstone yellow; feathers with black tips, and vermilion showing here and there. Length 6.00, wing 2.87, tail 2.00, tarsus 1.00–1.12, culmen .97–1.10. *Hab.* Hawaiian Islands, throughout the group.

Pl. XXVIII., 9792, 9342, 9338, 9333, 9340, 9348, 9899. **72. V. coccin'ea** FORSTER. **Iiwi.**

GENUS **PALMĘ'RIA** ROTHSCHILD.

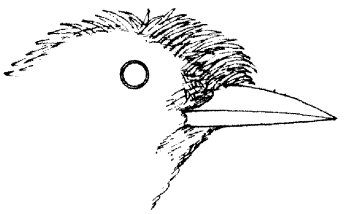

FIG. 4. P. DOLEI.

Forehead and crown covered with long lanceolate feathers forming a linear crest which rolls forward over the base of the beak; crest grey in front, darker on the crown; occipital feathers lanceolate, elongated and tipped with bright scarlet orange; feathers of the back blackish with silvery shaft stripes and tipped with scarlet orange; tail and wing feathers black, the former tipped (?), the latter narrowly margined with whitish; throat dirty silver grey; breast like the back. *Young:* Brownish grey above, with some black feathers showing orange tips; breast showing smoky grey; under tail coverts whitish. Length 6.50–6.75, wing 3.30–3.50, tail 2.65–2.80, culmen .70–.75, depth of bill .25, tarsus 1.10–1.20, toe .80. *Hab.* Molokai, Maui.

Pl. XXVIII., 6595, 6596. **73. P. dolei**[40] (WILSON).

GENUS **HIMATI'ONĘ** CABANIS.

FIG. 5. C. STEJNEGERI. H. SANGUINEA. C. PARVA. O. BAIRDI.

a. General color above dark crimson (blood red), richest on the head and neck; primaries black, faintly edged with ashy; secondaries with crimson buff; tail feathers black; throat, breast and sides uniform with the back; abdomen white. *Female:* Slightly lighter than the male(?). *Young:* General color brown, washed with fulvous or buff; with buffy margins to the wing coverts; lower parts similar to upper; with or without crimson feathers here and there, varying with age. Length 5.15–5.25, wing 2.70–3.00, tail 2.05–2.15, culmen .65–.70, depth of bill .15, tarsus .75–.80, toe .70. *Hab.* Hawaiian Islands, throughout the group.

Pl. XXVIII., 7996, 9803, 9322, 9898, 9309, 9324. **74. H. sanguin'ea** (GMEL.). **Apapa'ne.**

[40] The above species was named in honor of Hon. S. B. Dole, and not a "wine jar" as the erroneous spelling *dolii* would make it.

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aa. Head, throat and breast bright scarlet vermilion, richest on the head; abdomen grey-brown; under tail coverts lighter brown; upper tail coverts a lighter shade of vermilion than the head; primaries brownish black edged with buffy; secondaries brown edged with buffy and vermilion. *Female:* Similar, but paler. *Young:* Dull brown above and light ash on the under parts. Lighter than *H. sanguinea*, and with a shorter bill. Length about 5.25, wing 2.48–2.65, tail 2.25–2.40, culmen .50–.55, depth of bill .20, tarsus .80–.85, toe .70. *Hab.* Laysan.

75. H. freethi ROTHS. **Laysan Honey-eater.**

GENUS **CIRʹIDOPS** WILSON.

Breast, wings, tail and forehead black; occiput and upper part of mantle silvery grey, shading into smoky grey-brown on the mantle; lower breast, rump, upper tail coverts and median wing coverts bright scarlet; under tail coverts rich brown. Sexes and young unknown. Length about 5.50, wing 3.30, tail 2.20, culmen .40, tarsus .75, toe .70, hallux with claw .65. *Hab.* Hawaii.

76. C. anna (DOLE). **Ulaaihawane.**

GENUS **CHLORODREPʹANIS** PERKINS.

Upper parts olive; lower parts more or less olive or yellow; bill curved; first primary wanting; second primary equal to or longer than the third and fourth; nasal opercula overhung at the base by a few weak bristles; fifth quill equal to or longer than the first. *Young:* Duller and very similar in color, usually greyish olive on the back.

a. Wing never less than 2.35, bill perceptibly decurved.

b. Adults larger in size with stronger bills; beak not less than .60; wing in males not less than 2.55.

c. With scarcely a trace of black on the chin at the base of the lower mandible; lores blackish with a yellowish super-loral stripe; scarcely a trace of black at base of upper mandible; upper parts olive green, yellowest on the rump; forehead yellower olive than the crown; primary coverts, wing and tail feathers brown edged with olive; lower parts golden green, almost lemon yellow; bill strongest of the seven species. *Female* very similar. Length about 4.50–4.85, wing 2.62–2.70, tail 1.62–1.70, culmen .72–.75, depth of bill .25, tarsus .92, toe .70. *Hab.* Kauai.

Pl. XXIX., 9396. **77. C. stejnegʹeri** (WILSON). **Kauai Amakiʹhi.**

cc. With a fairly distinct, narrow, ill-defined, blackish band about the base of the beak; lores blackish; yellow super-loral stripe not reaching quite to the base of the beak.

d. Trifle larger; tarsus .82–.95; centre of breast yellower; upper parts dark olive green, yellowest on the rump, darkest on the head; lower parts fine yellow, yellowest on the chest; thighs grey; wing coverts, wing and tail feathers brownish black edged with olive. *Female:* Above greyish olive, greyest on the head,

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showing most yellow on the upper tail coverts and outer edge of primaries and tail feathers; with a whitish yellow super-loral stripe; lower parts grey washed with yellow. Length 4.50–4.70, wing 2.45 (♀ wing 2.75?), tail 1.75–1.95, culmen .60–.70, depth of bill .16, tarsus .80–.95, toe .65. *Hab.* Maui.

78. C. wilson'i (ROTHS.). **Maui Amakihi.**

dd. Trifle smaller; tarsus .75–.82; centre of breast more olive yellow. Length about 4.50, wing 2.40–2.60, tail 1.65–1.95, culmen .55–.65, depth of bill .16, toe .60. *Hab.* Molokai.

79. C. kalaa'na (WILSON)[41]. **Molokai Amakihi.**

bb. Adults averaging smaller in size; with weaker bills; beak not more than .60; wing not more than 2.60.

e. Above yellowish green, yellowest on the rump; bright yellow on the chest.

f. Abdomen showing more white; rump not so decided yellowish olive; wing coverts, primaries and tail feathers edged with olive green; edge of wing yellowish; under wing coverts white; lores, together with a scarcely perceptible streak over the base of the upper mandible, blackish; super-loral stripe indistinct yellow. *Female:* Grey olive green, greyest on the head; more tawny on the rump; wings and tail edged with olive; secondaries outer edge at tip white; median and greater wing coverts tipped with white or ochraceous white; greyish on the throat with more or less wash of yellow passing to tawny white on the breast, and fulvous on lower flanks. *Young males:* Showing more yellow and olive on the under parts. Length 4.75–5.10, wing 2.45–2.60, tail 1.70–1.80, culmen .56–.60, depth of bill .16, tarsus .80, toe .86. *Hab.* Oahu.

80. C. chloris (CAB.). **Oahu Amakihi.**

ff. Back olive yellow, becoming decided yellow olive on the rump; less olive below; lores greyish sooty; super-loral stripe less strongly contrasted with the adjacent parts. *Female:* Back quite olive grey, yellowest on the rump; lores darkest; super-loral stripe quite distinct; lower parts yellowish grey with olive. Length 4.20–4.40, wing 2.35–2.50, tail 1.70–1.80, culmen .60, tarsus .75–.85, toe .65. *Hab.* Lanai.

81. C. chloridoi'des[42] (WILSON). **Lanai Amakihi.**

[41] Differing but slightly from typical *C. chloris* and Mr. Wilson's proposed *Lanai* species *C. chloridoides*. Selected specimens from a short series of spring birds (May to June) show the following fairly constant differences. *Males:* Under parts of *kalaana* more olive and golden than in *chloridoides*, which in turn is less lemon yellow than in typical *chloris;* color of feet and beak similar; *kalaana* duller olive yellow above than *chloris*, which is duller than *chloridoides* which is decidedly yellowish olive on the rump; lores of *kalaana* blackest, *chloridoides* next, while *chloris* is decidedly greyish sooty; super-loral stripe most extensive in *kalaana*, brightest in *chloris*, and least contrasted with the adjacent parts in *chloridoides*. With the females *kalaana* is lightest olive grey above, quite light over the upper mantle and differing from *chloris*, which is deeper, and from *chloridoides* in being less olive grey; rump and tail coverts of *kalaana* grey with but slight olive cast; *chloris* is tawny olive, while *chloridoides* is olive green; lores of *kalaana* smoky grey, not differing from *chloris*, but lighter than *chloridoides* where they are sooty; super-loral stripes in *kalaana* yellower and more noticeable than in *chloris*, and less so than in *chloridoides* which is quite a decided yellow; below, *kalaana* greyish olive white with yellow wash; *chloris* with more grey and less yellow; *chloridoides* yellowish olive. Hence, *male kalaana* has the under parts more olive and golden, duller olive yellow above; lores blackest; super-loral stripe more extended; otherwise similar to *chloris*. *Female:* Lighter olive grey above, quite light over the mantle; rump similar to upper mantle; lores smoky grey; super-loral stripe more noticeable than in *chloris;* below, greyish olive washed with yellow; differing least from *chloris*. Both *kalaana* and *chloridoides* seem to be species of only sub-specific value.

[42] See note to *C. kalaana*.

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ee. Above yellowish olive with faint indication of orange(?) —not noticeable on old faded specimens—which is strongest on the rump; primaries and tail quills brownish edged with olive; lores and a narrow line over the forehead blackish; lower parts yellowish olive. *Female:* Duller than the male, with ashy cast to the upper parts; lower parts paler. *Young:* Similar to female. Length 4.40–4.60, wing 2.45–2.60, tail 1.65–1.80, culmen .50–.55, tarsus .85–.90, toe .65. *Hab.* Hawaii.

82. C. virens[43] (GMEL.). **Hawaii Amakihi.**

aa. Wing less than 2.30; bill but slightly decurved; smallest of the Hawaiian birds; bill more slender than in typical *Chlorodrepanis;* upper parts more uniform yellow. *Male:* Above, head, mantle and outer edge of wing and tail quills yellowish, brighter than an olive yellow; rump yellowest; below uniform yellow with but slight greenish tint. *Female:* Similar in size but much greener both above and below, with the under parts much duller, fading into greyish olive on sides of the abdomen. *Young* similar to female. Length 4.00–4.25, wing 2.20–2.30, tail 1.45–1.55, culmen .50–.53, tarsus .75–.80, toe .55. *Hab.* Kauai.

83. C. parva[44] (STEJN.).

GENUS **VIRIDON'IA** ROTHSCHILD.

Bill straight or but slightly curved, high and strong at the base, more attenuated towards the tip, and sharp; fourth and fifth primaries about equal, second shorter than the seventh; tail rather short; sexes similar; above olive green, showing more yellow on the forehead, chin and upper tail coverts; under parts more yellowish olive, greener than the upper parts and with a faint ochraceous cast; tail blackish brown with yellowish olive margins; under surface of wing dark ash with dusky white quills. Wing 2.80–3.00, tail 1.70–1.75, culmen .70, tarsus .83–.86, toe .73–.75, depth of bill .23. *Hab.* Hawaii.

84. V. sagittiros'tris ROTHS.

GENUS **OREOMY'ZA** STEJNEGER.

Under mandible straight, or at least not perceptibly curved; plumage soft and fluffy; tarsus covered in front with four, five or six scales; nasal operculum slightly overhung at the base by tiny feathers; tip of the wing formed by the third, fourth,

[43] Mr. Rothschild (Avifauna of Laysan, Part III., page 129) gives *Oreomyza perkinsi* as a new species from Hawaii, describing it as follows: "*Adult male:* Above light olive green (Ridgway Nom. Colors, Pl. X., No. 18), brighter on the rump; quills black edged with oil green; below olive yellow; vent greenish white; thighs dirty white; under wing coverts white with a yellow tinge; lores black; iris dark brown; legs and feet greyish brown; soles of feet yellowish-flesh color; upper mandible dark brown with paler base; lower mandible grey. Total length about 5.5 inches; wing 2.6, tail 1.7, tarsus 0.85, culmen 0.63. One male, Puulehua, Hawaii, September 25, 1891." In commenting on the specimen in the Tring Museum Mr. Rothschild states that the "remarkable specimen has a long but straight bill.....The coloration is that of *Chlorodrepanis virens*.....and that it might be a hybrid between *Oreomyza mana* and *Chlorodrepanis virens*." The B. P. Bishop Museum series, embracing many recently collected specimens, show *virens* with beaks approaching the straight form, though none that are to be confounded with the *Oreomyza* type; while fine old males of *Oreomyza mana* are much more highly colored than has been usually supposed. The only character in Mr. Rothschild's description which seems to be of specific value, when compared with the Museum series, is the length, which is given as almost an inch longer than the average of either *mana* or *virens*. Since the author fails to call attention to this point it may possibly be a typographical error. Mr. Henshaw informs me he has taken nothing that conforms with the description, and as Mr. Perkins has not met with the bird the status of the species is somewhat doubtful.

[44] At the suggestion of my friend Professor H. W. Henshaw we have made a careful study of the alcoholic material in the Museum, and find the tongue of *parva* to be distinctly tubular in form; a fact which alone would at once remove it from the genus *Oreomyza*, and which at the same time indicates its affinity with the tube-tonged *Chlorodrepanis* group. My observations of the bird alive, while collecting on Kauai, convince me that its habits are those of the *Chlorodrepanis* rather than of *Oreomyza*.

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fifth, or by the fourth, fifth and sixth feathers, the second shorter than the sixth; first primary obsolete.

a. Plumage not red.

b. Under parts not yellow or greenish yellow; culmen about .50, tail about 1.85.

c. Bill light colored; breast white or buffy white. *Male:* Above clear olive grey faintly washed with olive green, which is most marked on the rump; nearly white on the chin, becoming olive buffy on the breast; more yellowish on the abdomen, with the sides of the body light smoky olive grey; lores and forehead buffy white. *Female:* Similar, but duller. *Young:* With forehead, lores, superciliary stripe and throat white. Length 4.40–4.65, wing 2.50–2.75, tail 1.75–1.85, culmen .42–.50, depth of culmen .20, tarsus .78–.85, toe .55. *Hab.* Kauai.

Pl. XXIX., 9402. **85. O. bairdi** STEJN. **Akikihi.**

cc. Bill dark colored; below, whitish buff on the throat, becoming greener and greyer on the lower breast; lores sooty; abdomen and under tail coverts white with a yellowish wash; primaries and quills brownish. *Female:* Similar, but duller in color. *Young:* Similar, but showing more buffy white about the base of the bill and lores. Length 4.25–4.50, wing 2.60, tail 1.80–1.90, culmen .50, depth of bill .20, tarsus .85–.90, toe .70. *Hab.* Hawaii.

Pl. XXIX., 6664. **86. O. mana**[45] (WILSON).

bb. Under parts, throat, etc., greener or yellower; bill and tail relatively longer.

d. Yellowish olive green above; yellow of the forehead extending farther back onto the crown; crown and entire upper parts, including the edge of outer web of primaries and tail feathers, light yellowish green; primaries and tail feathers brownish black; lower parts, including edge of wings, lemon yellow; sides of body yellowish olive. *Female:* Similar to adult male, but less bright yellow below (Rothschild). *Quite young:* Greyish olive above, tail showing the most olive shade; median and greater wing coverts tipped with buffy white, forming two distinct bands across the wing; below, greyish white showing some yellow. Length about 4.50, wing 2.30, tail 1.95, culmen .50–.55, depth of bill .18, tarsus .92, toe .65. *Hab.* Lanai.

87. O. montana (WILSON). **Alauhiio.**

dd. Olive green above, yellow of the forehead more restricted.

e. Broad dusky loral mark; bill stronger; color deeper olive brown; more golden beneath. *Adult male:* Somewhat similar to adult *C. chloris*, but with the olive upper plumage darker, though tinged with yellow; forehead brighter than the crown, and with an obvious though ill-defined yellowish streak over the eye; lores brownish black; chin, cheeks, auriculars and throat clear golden yellow, which color pervades the breast and belly, becoming very pale, almost white on the

[45] See note following *Chlorodrepanis virens*, page 46.

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abdomen; lower tail coverts pale yellow; wing coverts with distinct whitish marks of considerable size. *Female:* Very unlike the male above described; streak over the eye and under parts yellowish white; sides of breast and flanks washed with olive grey; above, olive; the greater wing coverts with large greenish white tips. *Young:* Quite young birds and nestlings are much like the females, but are browner above and of a mottled appearance. Length 4.50–5.00, wing 2.60–2.81, tail 1.85–2.00, tarsus .80–.86, culmen .60–.65 (Rothschild). *Hab.* Oahu.

88. O. macula'ta CAB.

ee. Loral mark not so pronounced; greener above and paler yellow below; bill a trifle slenderer; forehead, lores, cheeks, chin and under parts bright lemon yellow; upper parts olive green, yellowest on the upper tail coverts; sides of body washed with olive; quills and tail feathers brown externally, edged with olive. *Female:* Similar to the male, but duller above and below. *Young:* Above grey with an olive tinge, more greenish grey on the rump; indistinct whitish super-loral stripe; throat and centre of body light buffy grey, greyer on the sides, with a faint wash of yellow; a distinct whitish buff band formed by the tips of the greater wing coverts. Length 4.50–4.65, wing 2.40–2.50, culmen .45–.50, depth of bill .15, tarsus .82–.85, toe .65. *Hab.* Maui.

Pl. XXIX., 6684, 6685. **89. O. new'toni** (ROTHS.).

aa. Plumage rich scarlet; bill and feet light; head all round, back and lower parts bright rich scarlet, darkest on the back, purest scarlet on the throat; upper mandible brownish grey above, darkest near the tip; under mandible whitish yellow; tarsus light brown in skins, pink in life. *Female:* Back and head brownish grey with a mixture of brownish dull scarlet, most apparent on the head and rump, outer edge of wing and tail feathers; under parts greyish white tinged with salmon and dull scarlet. *Young males* have more or less strong mixture of ferruginous brown or rufous above, washed with deep brown along the sides of the body, more obvious in younger individuals. Length 4.95–5.20, wing 2.60, tail 2.05–2.20, culmen .53–.55, depth of bill .17, tarsus .85–.90, toe .70. *Hab.* Molokai.

Pl. XXVIII., 6681, 8089, 8088. **90. O. flam'mea** (WILSON). **Kakawahie.**

GENUS **LOXOPS** CABANIS.

FIG. 6. L. COCCINEA.

Bill short and finch-like; culmen much shorter than the tarsus; wing moderate length, falling considerably short of the tail, and not equal to the length of the tail and tarsus combined; bill bluish grey.

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a. General color red, foxy or orange; no black on lores or forehead.

b. General color above, scarlet orange, dullest on the mantle; wing coverts, wing and tail feathers brownish black edged externally with dull scarlet orange; below, uniform scarlet orange, brighter than the back. *Female:* Greyer on the crown; loral region dusky whitish; back greyish with olive tinge, olive most pronounced on the rump and edge of wing and tail feathers; chin grey; breast greyish olive, greyer on the sides of body. *Young:* Similar to female; bill paler than in adults. Length 4.25–4.60, wing 2.40–2.50, tail 1.85–2.05, culmen .42, depth of bill .20, tarsus .77–.79, toe .60. *Hab.* Hawaii.

Pl. XXVIII., 6648, 6642. **91. L. coccin'ea** (GMEL.). **Akep'a.**

bb. General color above, orange or foxy.

c. Uniform orange, brightest on the breast; more yellow orange on the rump; primaries and tail feathers blackish brown edged with orange, like the back. *Female:* Similar, but duller. *Young:* Back of head and mantle decided grey with slight olive tinge; rump and breast more olive; sides greyer olive, very similar to young of *L. coccinea*. Length about 4.50, wing 2.60, tail 2.00, culmen .40, depth of bill .20, tarsus .80, toe .67. *Hab.* Maui.

Pl. XXVIII., 6638. **92. L. ochra'cea** ROTHS.

cc. Body, red foxy; lores blackish; wings and tail olive brown; wing coverts, quills and tail red-edged; inner edge of quills and under wing coverts white; bill short, triangular, conic; tip straight, acute, whitish; feet brown; tarsus nine lines (Grey's description). Gould says "that the whole of the plumage is rich rusty red deepening into brownish red on the back . . . . . Length 4 inches, bill $\frac{7}{15}$, wing $2\frac{1}{4}$, tail $\frac{3}{4}$, tarsus $\frac{3}{4}$." *Hab.* Oahu.

93. L. rufa[46] (BLOX.).

aa. With lores, a ring about the eye, and forehead smoky black; crown gamboge yellow fading into rich olive and passing into olive green on the mantle and wing coverts; rump, tail coverts and edge of tail feathers brighter yellowish olive; edge of primaries like the back; lower parts, including the sides of head, bright gamboge yellow, passing to olive yellow on the sides of the body; thighs smoky grey; wings and tail blackish brown. *Female:* Similar, except more green in the yellow, and with loral region not as well defined. *Young:* Greyish green above, grey with a very faint yellowish green wash below; sometimes smoky tips to the feathers; lores and forehead not well defined; bill lighter. Length 4.50–4.60, wing 2.40–2.50, tail 2.00–2.15, culmen .43–.45, depth of bill .20, tarsus .85, toe .60. *Hab.* Kauai.

Pl. XXIX., 9353, 9361. **94. L. cæruleiros'tris**[47] (WILSON). **Ou holowai.**

[46] Since the above description was written I have had the pleasure of examining the *Loxops* in the British Museum collections and quite agree with Mr. Rothschild in separating the Oahu species; and with Mr. Wilson in placing *westenholmii*, Roths., as a synonym of *L. rufa* (Blox.).

[47] Should be held sub-generically distinct from the other three members of the genus on account of the stronger bill, smoky loral patch and general color which is always different from typical *Loxops*.

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GENUS **HEMIGNA'THUS** LICHTENSTEIN.

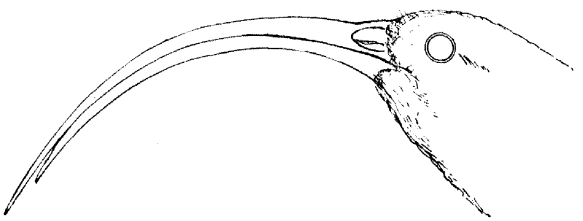

FIG. 7. H. OBSCURUS.

Bill very long, slender and curved, with the tongue as long as the bill; feet reaching to the tip of the tail (in the skin); tip of the wings falling short of the tip of the tail by less than the length of the hind toe and claw.

a. Back dull olive green; .....species has very inconspicuous plumage; the whole upper surface and wing feathers on the outside are dull olive green, the inner webs of the flight feathers dull brown. The under surface is light but still dull; throat and centre of the abdomen, as well as the under tail coverts, pale buff. A bright yellow superciliary stripe is very conspicuous, especially as directly underneath it from the beak to the eye there is a dark brown streak. The bow-shaped, curved bill, which terminates in a very fine, almost hair-like point, is exactly half as long as the body, and the under mandible is three lines shorter than the upper. The whole length, from the point of the bill to the end of the tail is 7 inches, bill 1¾, tail 1¾, tarsus 11 lines, middle toe and claw 9 lines (Excerpt from Rothschild's translation of Lichtenstein's description). *Hab.* Oahu; rare or extinct. (No specimens in the Museum.)

95. H. lichtensteini[48] WILSON. **Kipi.**

aa. Yellowish olive green above; under parts yellower.

b. Smaller size; bill shorter; above all over a beautiful bright olive green with a yellowish cast, yellowest on the rump, and with a distinct yellow mark over the eye; throat, sides of face and breast duller olive green than the back, fading into distinct whitish on the abdomen and under tail coverts, varied only with an olive wash; primaries and tail feathers brown with olive on the outer edges; lores smoky black; wings falling short of the tip of the tail by less than .50 (in the skin). *Female:* Above, greyish olive green; more olive green on the rump; lores blackish, above which is a pale superciliary stripe; chin whitish or greyish white with a yellowish tinge, becoming yellower on the chest and under parts, with olive tinge along the sides. *Young:* Similar to female. Length 6.25–6.50, wing 3.00–3.15, tail 1.80–1.85, chord of culmen 1.25–1.38, tarsus .87–.92, toe .80–.85, depth of bill .20, width of bill .25. *Hab.* Hawaii.

Pl. XXIX., 9421. **96. H. obscu'rus** (GMEL.). **Akialoa.**

[48] Since the first reference in Gray's synonomy (Cat. Birds Trop. Isds., p. 9) for *Drepanis* (*Hemignathus*) *ellisiana* is given "*Certhia obscura* (nec Gmel.) Vieill. Ois. dor. t. 53?". I prefer to consider that it is the *reference* to the exact place in the volume cited that Gray was in doubt about, and that he did not intend questioning the name *Certhia obscura*. That being the case *Drepanis* (*Hemignathus*) *ellisiana* will become a synonym of *Hemignathus obscurus*. Hence it seems that Mr. Wilson's name *H. lichtensteini* should stand,

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bb. Larger size, bill and wing longer.

c. Chord of culmen not less than 1.95, averaging 2.15; above, bright olive yellow, yellowest on the rump; on crown and forehead the feathers have dark centres with olive edges which give a "scaled" appearance to the region; a distinct superciliary stripe; under parts from chin to tail yellow with an olive tinge; wings and tail brown edged with olive on the outer webs; lores black. *Female:* Quite different from the male; above, grey with an olive tinge; rump yellowish olive; head scaled as in the male; super-loral line dingy yellowish white; lores black; throat greyish white; breast yellowish white with an olive green wash. *Young:* Have less yellow below and over the eye, scarcely any olive on the back, which is greyish; scales on the crown less noticeable. Length 7.00–7.50, wing 3.40–3.55, tail 2.10–2.25, chord of culmen 1.95–2.35, tarsus 1.05–1.10, toe 1.00. *Hab.* Kauai.

Pl. XXIX., 8130. **97. H. pro'cerus** CAB. **Kauai Akialoa.**

cc. Chord of culmen not exceeding 1.95(?). Above, yellowish olive green somewhat mixed with greyish brown on the head where the bases show through. Quills dark brown edged with the color of the back; rectrices the same. Below, yellowish olive green much less bright than on the back and with little yellow in it, shading into olive buff on the vent, and with a brown pale shade on the throat, etc. Length 6.00 inches in the skin, wing 3.30, tail 2.10, tarsus 1.93, chord of culmen 1.90. *Female:* Smaller, more greenish olive, and less bright; superciliary stripe faint and greenish. Chin, throat and middle of abdomen buffish yellow (From Rothschild's description). *Hab.* Lanai.

98. H. lanaien'sis ROTHS. **Lanai Akialoa.**

GENUS **HETERORHYN'CHUS** ROTHSCHILD.

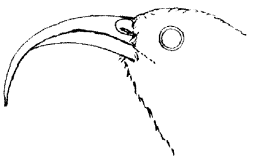

FIG. 8. H. AFFINIS.

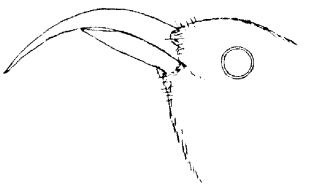

FIG. 9. H. WILSONI.

Upper mandible much longer than the lower; tongue not as long as the upper mandible.

a. The under mandible curved; smaller size.

b. Head yellow; no decided superciliary stripe.

c. Color of the forehead bright deep gamboge yellow, not extending over the crown, sharply defined from the greyish olive of the neck and back; wings and tail blackish brown with olive outer edges to the feathers; lores black, and con-

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nected by a narrow black band across the forehead; throat and chest rich gamboge yellow; abdomen whitish with a yellowish cast; flanks olive grey; edge of wing yellowish. *Female:* Above, olive green, a yellowish super-loral stripe; lores dusky grey; chin and throat yellow; centre of lower parts pale yellow; sides olive grey. *Young:* Similar to female. Length 5.00–5.25, wing 2.95–3.00, tail 1.80–1.95, chord of culmen .95–1.05, tarsus .85–.90, toe .75–.80. *Hab.* Maui.

Pl. XXIX., 6620. **99. H. affi'nis** ROTHS.

cc. Gamboge yellow of the forehead more or less indefinable from the fine olive yellow of the back into which it gradually merges, olive yellow purest on the rump; primaries and tail feathers brown edged with the olive of the back; lores and a narrow line above the bill a deep black; throat, breast and sides of the head a bright gamboge yellow, brighter than the forehead; breast with a slight olive tinge; abdomen and under tail coverts white. *Female:* Above, grey with an olive cast, most pronounced on the head and rump. Below, dusky white, greyest on the sides of the body and throat. *Young:* Similar to females, the males showing yellow on the throat at an early age. Length about 5.50, wing 2.85–3.20, tail 1.85–2.05, culmen .95–1.10, tarsus .90, toe .80. *Hab.* Kauai.

Pl. XXIX., 6633, 6636. **100. H. hanape'pe** (WILSON). **Nukupu'u.**

bb. Head green; a very distinct superciliary stripe. *Male specimen in Paris Museum:* Above, olive green, darker and more olive on the back; lighter, more green on the head, wing and tail coverts; lores and line behind the eye brownish black. Across the forehead and above the eyes conspicuous orange yellow superciliary stripe; Quills deep brown, outer web edged with greenish yellow; chin, throat and upper breast bright orange yellow; abdomen yellow and fading into pale greenish grey on the vent and under tail coverts. *Adult female or immature male in the Frankfort Museum:* Above, dull brownish olive tinged with greenish on the top of the head, rump and upper tail coverts and on the edge of the quills and tail feathers. Lores dusky; a somewhat ill-defined but distinct superciliary stripe; sides of the head and throat yellowish. An immature male in the Leiden Museum is somewhat similar to the Frankfort specimen. Length 5.50, culmen 1.10, wing 2.95, tarsus .76, tail 2.9(?). (Condensed from Rothschild's descriptions in Avifauna of Laysan, etc.) *Hab.* Oahu; extinct.

101. H. lu'cidus (LICHT.).

aa. Gonys of under mandible straight and strong at the base; above, olive green, brightest on the rump, and yellowest on the head; lores black; below rich gamboge yellow on the chin, gradually fading into olive yellow on the sides of the abdomen and under tail coverts; under wing coverts with yellowish shade of white; quills and primaries brown edged with olive. *Female:* Above, greenish olive grey, with olive brightest on the rump; throat and breast pale yellow shading into greyish white, with olive

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infusion on the belly and flanks. *Young* duller and greyer. Length 5.50–5.75, wing 3.20–3.35, tail 1.85–2.00, culmen .85–1.03, tarsus .90–.96, toe .85. *Hab.* Hawaii.

Pl. XXIX., 6632, 6630. **102. H. wil'soni**[49] ROTHS.

GENUS **PSEUDONES'TOR** ROTHSCHILD.

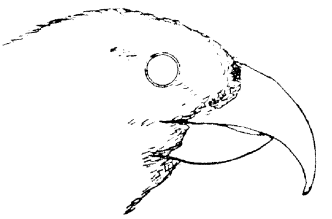

FIG. 10. P. XANTHOPHRYS.

Upper parts with grey bases to the feathers, and greenish olive ends, giving the back a somewhat greenish grey cast, more inclined to olive on the rump; broad superloral stripe light yellow; lores dusky, extending backward through the eye; breast canary yellow; abdomen yellowish white; greyish olive on the flanks; under tail coverts with a yellowish tinge; upper mandible blackish; lower mandible whitish; bill strongly hooked; gonys much curved. *Female and young:* Duller above; yellow of throat not so pronounced. Length 5.15–5.50, wing 2.70–2.90, tail 1.75–1.90, culmen .65–.85, depth of bill .55–.65, tarsus .85–.87, toe .80. *Hab.* Maui.

Pl. XXIX., 6607. **103. P. xantho'phrys** ROTHS.

GENUS **PSITTACIROS'TRA** TEMMINCK.

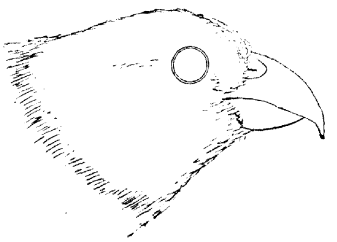

FIG. 11. P. PSITTACEA.

Head and upper neck, all around, a rich light gamboge yellow, sharply defined against the greenish grey of the mantle and olive grey of the chest; rump olive green; tail and primaries dusky brown edged with olive green; olive on the sides and flanks; abdomen and under tail coverts whitish grey; bill and feet pink; upper mandible exceeding the lower usually by about .15. *Female:* Upper parts, including head and neck, uniform olive green; greyish on the neck; under parts greyish white, washed with yellow; under tail coverts white. *Young:* Similar to the female, but more uniform grey above and below, except the abdomen, which is whitish; bill dark. Length 6.30–

[49] The above characters are sufficient to separate *wilsoni* from its fellows, sub-generically at least, if not entitling it to generic rank.

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6.60, wing 3.80–4.00, tail 2.50–2.60, culmen .55–.60, tarsus .87–.90, toe .90–.95. *Hab.* Kauai, Molokai, Lanai, Hawaii, Oahu.[50]

Pl. XXIX., 6612. **104. P. psitta'cea** (GMEL.). **Ou'.**

GENUS **LOXIOI'DES** OUSTALET.

Head and neck to the mantle, and breast to the middle of the body, uniform bright gamboge yellow; back and upper coverts ashy grey, decidedly ashy on the rump; wing coverts, primaries and tail feathers dusky brown or blackish edged with yellowish olive; abdomen and under tail coverts dusky whitish with a bluish cast. *Female:* Similar, but with the yellow showing a brownish wash; with a greenish cast to the under parts. Length about 7.50, wing 3.55–3.75, tail 2.55–265, depth of bill .60, tarsus .95–1.00, toe .75. *Hab.* Hawaii.

105. L. bailleu'i OUST. **Pali'la.**

GENUS **TELESPI'ZA** WILSON.

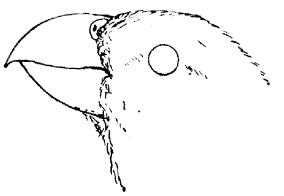

FIG. 12. T. CANTANS.

Head all around, neck and under parts to the middle of the abdomen bright yellow, brightest on the head; back bright olive yellow with varying blackish shaft streaks; rump grey with some olive cast at times; webs of primaries and tail feathers brown; secondaries blackish edged with yellowish olive; wing coverts deep brown broadly edged with yellowish olive; bill horn color. *Immature:* Feathers of the head deep brown with yellowish edges; upper surface with centre of feathers deep brown or blackish edged with light brown; rump uniform brown; tail and primaries brown edged with olive yellow; throat and breast yellow with brown shaft stripes; centre of the abdomen white; sides and under tail coverts brown, or olive brown, and with brown shaft stripes. *Young:* Similar to immature birds, except yellow reduced to the slightest tinge about the head and wings. Length 6.25–6.50, wing 3.25–3.40, tail 2.55–2.60, culmen .65–.70, depth of bill .47–.50, tarsus .95–1.00, toe .95. *Hab.*[51] Laysan.

Pl. XXIX., 8731. **106. T. can'tans**[51] WILSON. **Laysan Finch.**

[50] In October, 1899, I saw a specimen in the bushes up Moanalua valley which I believe to have been the above species, though of course I cannot be positive of the identity. Since the preparation of the above, Mr. Rothschild (Birds of Laysan, Part III., page 193) has separated the Oahu form from the Hawaii bird, giving the principal differential character as "having the middle of the breast and belly, the feathers of the tibia and under tail coverts whitish; whereas, the adult males of the Hawaii bird "have the under parts olive green merging into whitish only in the middle of the lower abdomen." The name given to "the Honolulu Ou" is *Psittacirostra olivacea*, Roths.

[51] With a good series of birds before me I am unable to separate *cantans*, Wilson, from *flavissima*, Roths. The latter seems to be only fully mature specimens of the former, and in a plumage which requires some time for the individual to assume. Director Wm. T. Brigham also informs me that specimens brought from Laysan and kept in his aviary for a long time passed through several of the intermediate stages on the way from *cantans* to *flavissima* before they were accidentally killed.

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GENUS **RHODACAN'THIS** ROTHSCHILD.

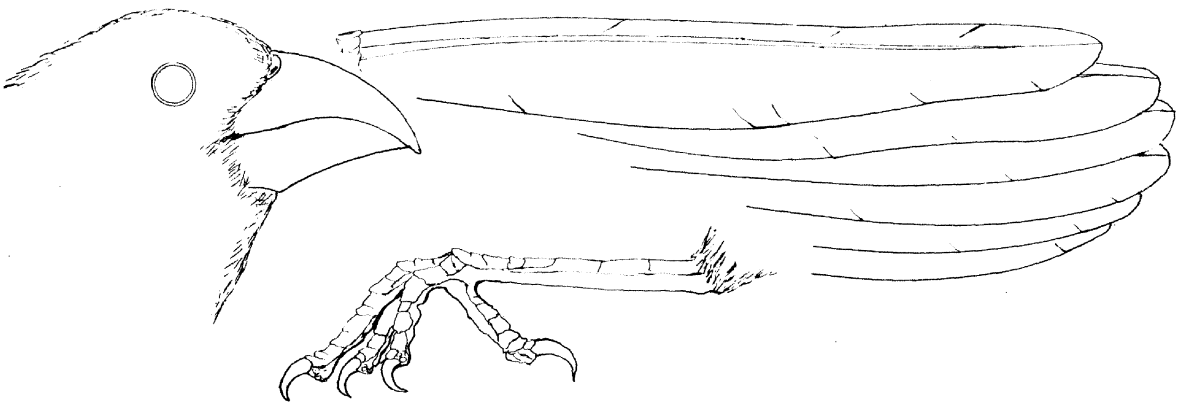

FIG. 13. R. PALM'ERI.

a. Head, throat and under parts throughout rich scarlet orange; breast purer orange tinge; under tail coverts and flanks showing some grey; mantle brown; rump orange brown; tail and wing feathers brown, with some orange brown; wing and tail feathers brown with orange brown edgings to the outer webs; bill bluish grey. *Female:* Above, greenish olive with dark grey bases to the feathers; more olive on the rump and upper tail coverts; tail and wing feathers with olive edges; breast showing grey as the under color, with yellowish olive edges, yellowest on chin and upper breast; centre of the breast whitish with but faint yellowish wash; flanks greenish yellow. *Young:* Similar to females; young males brighter below. Length about 7.50, wing 4.20–4.40, tail 2.90–3.00, culmen .80–.85, depth of bill .58–.61, tarsus 1.00–1.05, toe 1.00. *Hab.* Hawaii.

Pl. XXIX., 6603, 6601. **107. R. palm'eri** ROTHS.

aa. Head, neck and under parts generally apple yellow, brightest and richer on the head and neck, and greener on the under parts; upper parts ashy green, becoming bright green on the lower back, rump and upper tail coverts. Wings and tail dull blackish brown, feathers externally margined with green; bill blue-brown; legs grey; iris brown. Total length about 7.50, culmen .72, wings 3.80, tail 2.50, tarsus 1.00. *Adult female:* Differs from the male in being much greener and duller in color, only the forehead being yellow; the crown similarly colored to the back; under parts dull yellowish green. Palmer obtained a small series in the district of Kona at the same place where *R. palmeri* was first collected. The smaller size and yellow head of the adult male serves to distinguish this species very easily from the much larger *R. palmeri* with its orange red head in the adult male. Neither Wilson nor Perkins met with this bird (Rothschild in Part III., Avifauna of Laysan, etc.). *Hab.* Hawaii.

108. R. flav'iceps ROTHS.

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GENUS **CHLO'RIDOPS** WILSON.

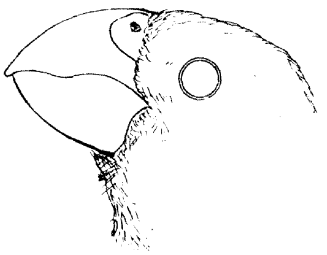

FIG. 14. C. KONA.

Female: Above, decided olive green, more olive on the upper tail coverts, and with dark centres to the feathers of the head, producing a scaled appearance; under parts of the abdomen and flanks yellowish olive; under tail coverts whitish; quills and tail feathers brown with olive edgings on the outer web; bill extremely thick and clumsy. (Male probably brighter?) Length 6.00–6.50, wing 3.30–3.45, culmen .70, depth of bill .70, width of bill .60, tarsus .85–.90, toe .85. *Hab.* Hawaii.

109. C. ko'na WILSON.

FAMILY **MELIPHAG'IDÆ.**—HONEY-EATERS.

Genera.

With no white feathers about the eye; nostrils operculate; first primary about half the length of the second; secondaries three-fourths the length of the wing; tip of the wing formed by the fourth, fifth and sixth primaries. (Sub-family *Meliphaginæ.*)

a. Smaller; wing less than 5.00; tail black or brownish black; with or without pectoral tufts..... .(Page 56.) **Moho.**[52]

aa. Larger; wing more than 5.00; tail brown or greenish brown.
(Page 58.) **Chætop'tila.**

GENUS **MOHO** LESSON.

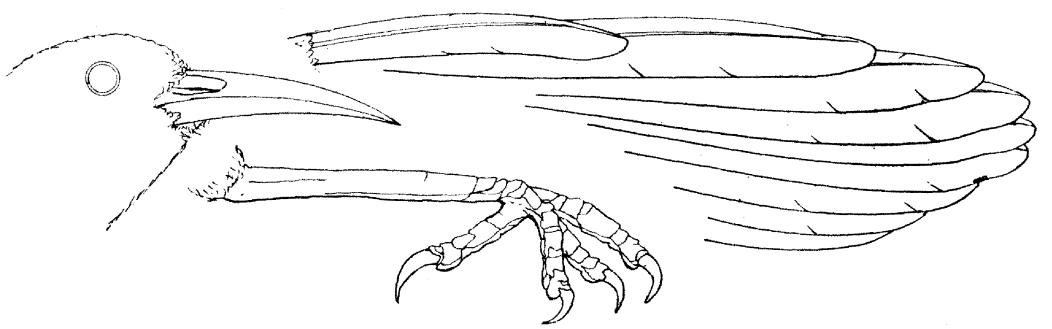

FIG. 15. M. NOBILIS.

a. With no yellow pectoral tufts; tail feathers uniform blackish without any trace of white on the outer pair; crown black with a greyish cast; upper surface brown

[52] Since it is doubtful if *Moho* should ever have been set aside, to accord with the Stricklandian code, and since it is certain that by the A. O. U. code *Moho* would stand against *Acrulocercus*, it is preferable to use the former name for this genus.

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or brownish black with faint white shaft stripes on the mantle; upper tail coverts rusty brown; wing and tail feathers blackish brown; throat and neck to chest black with white shafts and bars; under wing coverts mostly white; thighs yellow; breast uniform with the back; sides of the body less rusty brown than the upper tail coverts; bill and feet black. *Female:* Similar to male, but smaller. *Young:* Differing from the adult in having the tibiæ blackish instead of yellow, and with the greyish shaft stripe to the feathers of back and breast indistinct or wanting. Length 7.50–9.00 (according to tail), wing 3.70–4.00, tail 3.60–4.25, culmen 1.10–1.15, depth of bill .25, tarsus 1.25–1.35, toe .95. *Hab.* Kauai.

Pl. XXIX., 5463. **110. M. bracca'tus** (CASSIN). **Oo aa.**

aa. With yellow pectoral tufts, and more or less white on the outer pair of tail feathers.

b. With elongated yellow ear tufts, uniform in color with the few yellow feathers under the wing and the under tail coverts; a faint edge of whitish on the outer margin of the outer pair of tail feathers; remainder of tail uniform glossy black, like the primaries; crown and rump black; back, chest and abdomen black, with conspicuous white shafts to the feather; throat black; bill and feet black; central tail feathers with weak shafts; long and plume-like. *Female* similar(?). Length about 11.00, wing 4.55–4.75, tail 5.00–6.25, culmen 1.32, depth of bill .30, tarsus 1.50–1.55, toe 1.05. *Hab.* Molokai.

111. M. bish'opi (ROTHS.).

bb. Without elongated yellow ear tufts; tail with prominent white tips to the outer feathers.

c. With only the two outer tail feathers with white tips; head, rump, back, wing coverts and lower parts deep black with some gloss; upper mantle, lower part of the abdomen and inner edge of secondaries inclined to umber brown; tufts under the wings and under tail coverts bright golden yellow; primaries and tail feathers black; bill and feet black. *Female:* Similar, but smaller. *Young:* With no yellow beneath the wings. Length ♂ 12.50–10.50 ♀, wing 4.85–4.90, tail 7.50, culmen 1.15, depth of bill .25, tarsus 1.40, toe 1.00. *Hab.* Hawaii.

Pl. XXIX., 5457. **112. M. nob'ilis** (MERREM.). **Oo.**

cc. All the tail feathers, except the middle pair, tipped with white. General color sooty black; tail brown, all tipped as above; centre pair somewhat narrower than the others and gradually diminishing to the apical third of their length into fine hair-like, or filamentous, upturned points; axillæ or under surface of the shoulder white; flanks and under tail coverts bright yellow; bill and legs black. Total length 12 inches, bill 1½, wing 4¾, tail 6¾, tarsus 1½ (Gould). *Hab.* Oahu; rare or extinct. (No specimen in the Museum.)

113. M. apica'lis GOULD. **Yellow-tufted Honey-eater.**

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GENUS **CHÆTOP'TILA** SCLATER.

Tail greenish brown; feathers of the forehead, crown and back of the neck, with whitish shaft stripe, blackish webs and tipped with olive—black predominating on the crown—most olive on the neck; lores and ear coverts blackish; an indistinct grey superciliary stripe; throat dusky white, washed with yellow; breast dingy white with black stripes; abdomen and under tail coverts with fewer stripes and more olive than the chest; flanks and upper tail coverts ochraceous black with white shafts and terminal spots; primaries and secondaries brown edged with olive; under wing coverts brown. Length about 13.50, wing 5.75, tail 6.65, culmen 1.25, depth of bill .31, width .45, tarsus 1.60, toe 1.15, hallux with claw 1.02. *Hab.* Hawaii; rare or extinct.

Pl. XXX., Frontispiece. **114. C. angustiplu'ma** (PEALE).

FAMILY **SYLVI'IDÆ.**—WARBLERS, ETC.

Genus.

Bill slender, but rather wide and depressed; wing long and flat, about equal to the tail in length, with a very small bastard primary not extending beyond the wing coverts; birds not migratory; no white on the tail (Sub-family *Sylviinæ*); rectal bristles fairly well developed; wing more than 2.70; second primary longer than the fifth; upper parts brownish with greyish cast; a faint buffy white super-loral stripe; outer tail feathers more than .25 shorter than the longest pair.

(Page 58.) **Acroceph'alus.**

GENUS **ACROCEPH'ALUS** NAUMANN.

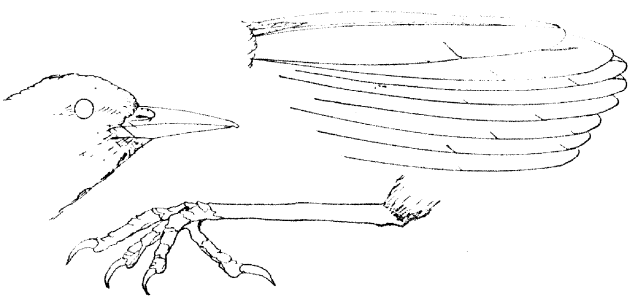

FIG. 16. A. FAMILIARIS.

Upper parts brownish with a greyish cast, greyest on the neck; under parts buffy white including the edge of wing, and a super-loral stripe; wing and tail feathers brownish; feet black; bill horn-brown; nostrils rounded and exposed; sexes similar. *Young* (?). Length about 5.65, wing 2.30–2.40, tail 2.30–2.40, culmen .60, tarsus .75–.90, toe .72, depth of bill .15. *Hab.* Laysan.

Pl. XXVII., 8735. **115. A. familia'ris** ROTHS. **Miller Bird.**

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FAMILY **TURDIDÆ.**—THRUSHES, ETC.

Genus.

The young different from the adults, having the under parts spotted; tarsus for the greater part of its length without transverse scutulæ, being booted; bill somewhat depressed, with a few rictal bristles; gonys about one-third the length of the commisure of the beak (Sub-family *Myadestinæ*); inner toe about equal to the hind toe; nostrils exposed and not hidden by bristles, and situated in a wide oval groove; culmen not longer than the hind claw; second primary longer than the secondaries; bill with a distinct sub-terminal notch.....(Page 59.) **Phæor'nis.**

GENUS **PHÆOR'NIS** SCLATER.

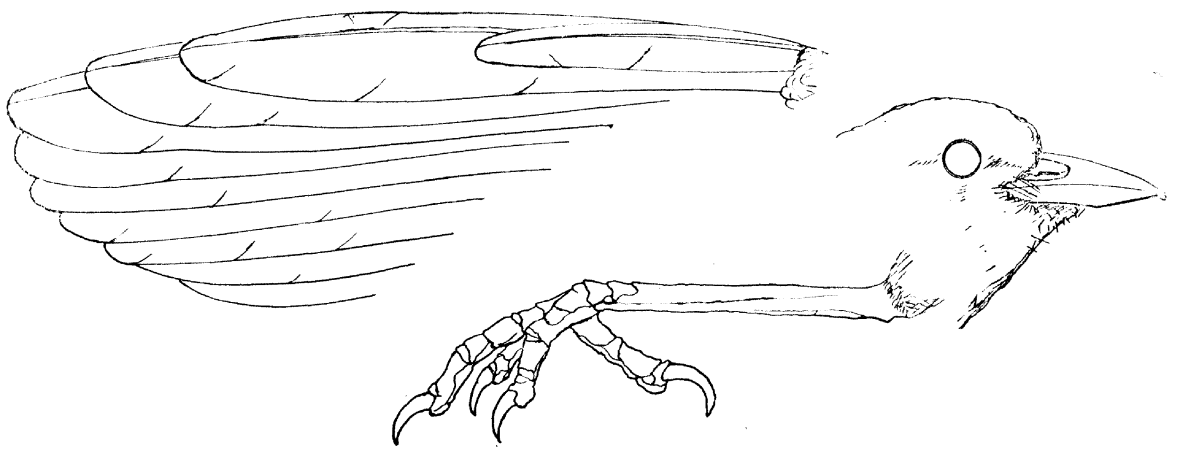

FIG. 17. P. OBSCURA.

a. Uniform in color above, brown or hair-brown, with faint olive wash.

b. Very conspicuous buffy white mark on the outer tail feathers.

c. Wing less than 4.00; feet light flesh-color; above, dull brown with an olive cast, most pronounced on the middle of the rump and mantle; throat and lores bluish grey; chest bluish ash or grey, sometimes mottled with blackish; abdomen and under tail coverts buff-white; outer web of primaries with very dull brown edge; inner web edged so as to form a dull buffy patch at base of feathers; outer tail feathers edged with whitish or fulvous on the inner web; ends of primary coverts blackish, forming a patch. *Young:* Feathers above, brown with broad blackish borders to the tip, and before this a creamy buff, more or less triangular spot; feathers of lower parts ashy brown at the base, then lighter cream color and broadly bordered with blackish brown, these borders blackest and broadest on the breast (Rothschild). Length about 6.15, wing 3.35, tail 2.45, culmen .70, depth of bill .20, width of bill .22, tarsus 1.30, toe .95, gonys .32. *Hab.* Kauai.

Pl. XXVII., 6693.

116. P. palm'eri ROTHS. **Puaiohi.**

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cc. Wing more than 4.00; feet dark colored; above, dull brown with a rusty olive tinge; sides of head and ear coverts tawny, always more or less mottled with rusty and grey; quills blackish, edged externally with rusty olive, which color forms a spot at the base of the inner primaries, below which the blackish tips of the greater wing coverts form a less pronounced spot; inner edge of the wing feathers without buffy patch; outer edge of each primary for almost its entire length rusty; lower parts dull smoky grey in appearance, shading into whitish on the abdomen; tail feathers like back, outer three pairs tipped with white or buffy white, pronounced on the tips and gradually fading into the ground color of the web; feet dark brown. *Female* similar. *Young:* Similar to *P. obscura*, but can be distinguished by the markings on the outer web of primaries, the white of the tail, and the broader bill. Length 7.50–8.50, wing 4.05–4.18, tail 3.20–3.30, culmen .50–.55, depth of bill .22, width of bill .40, tarsus 1.25–1.32, toe .95, gonys .25. *Hab.* Kauai.

Pl. XXVII., 9385. **117. P. myadesti'na** STEJN. **Kamau'.**

bb. With no conspicuous white markings on the outer tail feathers.

d. Wing 3.50–3.75; color lighter below; a distinct black patch near the base of the outer web of inner primaries; above, olive brown with a faint wash of greyish; head darker; primaries and tail feathers brown (quills and webs practically the same color), with the edge of the outer webs rusty or rusty brown; outer web of the inner primaries and the secondaries with a distinct black patch, bordered in front and behind by the rusty edges of the feather; chin and throat pale grey, the grey passing to white on the abdomen; under tail coverts buffy white; wing pattern on the inner web of primaries marked at all ages; no white on outer tail feathers. *Female* similar. *Young:* Similar to allied species, but with the wing pattern on the inner web, no white on the tail, and with the black patch on the outer edge of inner primaries as in adults. Length about 7.00–7.50, wing 3.50–3.75, tail 3.25–3.30, culmen .57–.60, depth of bill .22, width of bill .30, tarsus 1.25–1.30, toe .95, gonys .27. *Hab.* Lanai, Molokai.[53]

Pl. XXVII., 8094, 8096. **118. P. lanaien'sis** WILSON. **Olomau.**

dd. Wing not less than 3.90; color darker below; above, dusky olive brown (fading to hair-brown—Mills specimens); forehead greyer; under parts ash-grey; white on the abdomen and under tail coverts; primaries and tail feathers brown, shaded with dusky olive; quills of tail feathers umber brown above; base of secondaries showing a rusty spot; pattern on the inner web of quills scarcely discernible; bill and feet blackish; no white on the tail feathers. *Female* similar. *Young:* Spotted like young thrushes; each feather above is bordered with blackish, and before the blackish border is a more or less triangular buff spot; the feathers below are buffy white and broadly bordered with blackish brown (Rothschild).

[53] The form from Molokai should probably be separated as a sub-species. No specimens from Molokai at hand.

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Length 6.90–8.00, wing 3.95–4.00, tail 2.85–2.95, culmen .55–.62, depth of bill .22–.25, width of bill .30–.35, tarsus 1.22–1.30, toe .97, gonys .26. *Hab.* Hawaii.

Pl. XXVII., 6615, 9922, 9923. **119. P. obscu'ra** (GMEL.). **Omau.**

aa. Upper parts olive brown, extremities of the feathers much lighter color; tail and wings brown; bill bristled at the base; length 7.50 (Bloxham). Nothing farther is known of this evidently extinct species than is given above, and which is taken from Bloxham's account of the birds secured on the voyage of the *Blonde*, where it is given as "*Turdus sandvicensis* (var.), from Oahu."

120. P. oahuen'sis WILSON & EVANS.

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KEY TO THE HIGHER ORDERS.

a. All four toes united by a web or membrane....(Page 13.) Order **Steganopodes.**

aa. Hind toe, when present, not connected in any way with the other toes.

b. Nostrils peculiarly tubular, and feet webbed....(Page 10.) Order **Tubinares.**

bb. Nostrils not tubular, or feet not webbed.

c. Feet webbed; cutting edge of the bill dentate; bill as in ducks, geese, etc. (Page 16.) Order **Anseres.**

cc. Cutting edge of the bill not fringed or dentate, or else feet not webbed.

d. Toes distinctly webbed; legs inserted well forward towards the middle of the body, which is held horizontal.....(Page 5.) Order **Longipennes.**

dd. Toes not distinctly webbed, or else tarsus longer than the tail.

e. Lower portion of thigh naked, or else bill long and with grooves extending along the sides.

f. Lores naked; hind toe long and inserted on the same level with the middle toe.....(Page 20.) Order **Herodiones.**

ff. Lores feathered; hind toe, when present, never exceeding the length of the lower mandible.

g. Hind toe longer; inserted on a level with middle toe (when long as the under mandible head with frontal shield).....(Page 22.) Order **Paludicolæ.**

gg. Hind toe shorter; if present, inserted more or less above the level of the middle toe.....(Page 24.) Order **Limacolæ.**

ee. Lower portion of the thighs feathered; the bill, if lengthened, not grooved along the sides.

h. Bill strongly hooked, with a distinct naked cere at base of upper mandible.....(Page 32.) Order **Raptores.**

hh. Bill not strongly hooked, and without naked cere at the base of upper mandible; or, if with a cere, it is soft and swollen in life.

i. Hind toe small and elevated. (Page 30.) Order **Gallinæ.**

ii. Hind toe always well developed and on the same level with the middle one (mainly perching birds).

j. With soft swollen cere at the base of upper mandible. (Page 31.) Order **Columbæ.**

jj. Without a soft swollen cere; toes, three in front, one behind, and on the same level; not united by web, and tarsus equal to or longer than the hind toe with claw.....(Page 34.) Order **Passeres.**

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TABLE SHOWING THE DISTRIBUTION OF BIRDS IN THE HAWAIIAN GROUP.

The o denotes its occurrence; † rare or extinct; ? uncertain or questionable record.

NAME.	Hawaii.	Maui.	Lanai.	Molokai.	Oahu.	Kauai.	Niihau.	Laysan.	Lisiansky.	French Frigates.	Midway.	Accidental or wide-ranging.
Larus barrovianus	o	o	..	..	..	o	..	o	..	..	..	o
californicus	..	o	..	..	..	..	..	..	..	..	..	o
delawarensis	..	o	..	o	..	..	..	..	..	..	..	o
franklinii	..	o	..	..	..	..	..	..	..	..	..	o
philadelphia[1]	..	..	..	..	..	o	..	..	..	..	..	o
Sterna fuliginosa	o	o	o	o	o	o	..	o	o	o	o	o
lunata	..	..	..	..	..	..	..	o	o	o	..	o
melanauchen	..	..	..	..	..	o	..	..	..	..	..	o
Anous stolidus	o	..	..	o	o	o	..	o	..	o	..	o
Microanous hawaiiensis	o	..	..	o	o	o	o	o	o	o	o	
Gygis alba kittlitzi	..	..	..	..	..	..	..	o	o	..	..	o
Diomedea nigripes	..	..	..	..	..	o	o	o	o	o	o	o
immutabilis	o	..	..	..	..	..	o	o	o	o	o	o
Æstrelata phæopygia[2]	?	..	..	..	..	o	..	o				
hypoleuca	..	..	..	..	..	..	..	o	..	..	..	o
Bulweria bulweri	o	..	..	..	..	o	..	o	..	o		
Priofinus cuneatus	..	..	..	..	..	o	..	o	o	o		
Puffinus nativitatis	..	..	..	..	..	..	..	o	..	o		
newelli	..	o	..	..	..	o						
Oceanodroma castro[3]	..	..	..	..	..	o	?	..	..	o		
fuliginosa	..	..	..	..	..	..	..	o				
Phalacrocorax plagicus	..	..	..	..	..	..	..	o	..	..	..	o
Phaëthon rubricauda	o	..	..	..	..	o	o	o				
lepturus	o	o	..	o	o	o	o	..	..	..	..	o
Sula cyanops	..	..	..	..	..	..	..	o	o	o	o	o
piscator	..	..	..	..	o	..	o	o	o	o	o	o
sula	..	..	..	..	..	..	..	..	o	o	o	o
Fregata aquila	o	o	o	o	o	o	o	o	o	o	o	o
Merganser serrator	o	..	..	..	o	..	..	..	..	..	..	o
Anas boscas	..	..	..	..	..	..	..	o	..	..	..	o
wyvilliana	o	o	?	?	o	o						
laysanensis	..	..	..	..	..	..	..	o	?			
Nettion crecca	..	..	..	..	..	..	..	o	..	..	..	o
Querquedula circia	..	..	..	..	..	..	..	o				

[1] Since the foregoing pages were in print Mr. Rothschild has published a record of the taking of a single specimen of this small gull at Poli-hula lake, on Kauai, on March 15, 1891, by Mr. Palmer. See Avifauna of Laysan, etc., Part III., p. 286.

[2] There seems to be some reason for separating the Hawaiian form from the Galapagos form under the name *Æstrelata phæopygia sandvicensis*, Ridgway. More material is required to thoroughly establish the sub-species.

[3] In the text this species is given as *O. cryptoleucura*. That name has been recently found to be a synonym for *Oceanodroma castro* (Harcourt).

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TABLE OF DISTRIBUTION.—*Continued.*

NAME.	Hawaii.	Maui.	Lanai.	Molokai.	Oahu.	Kauai.	Niihau.	Laysan.	Lisiansky.	French Frigates.	Midway.	Accidental or wide-ranging.
Charitonetta albeola	..	o	..	..	..	..	..	o	..	..	..	o
Spatula clypeata	o	o	..	..	o	o	..	..	..	..	..	o
Mareca americana	..	..	..	..	..	..	..	o	..	..	..	o
Dafila acuta	o	o	..	o	o	o	..	..	..	..	..	o
Chen hyperboreus	..	o	..	..	..	..	..	o	..	..	..	o
Branta canadensis minima	?	..	..	..	..	o	..	..	..	..	..	o
nigricans	?	o	..	..	..	..	..	o	..	..	..	o
Nesochen sandvicensis	o											
Plegadis guarauna	..	..	..	o	..	o	..	..	..	..	..	o
Demiegretta sacra	..	..	..	..	..	..	..	..	..	..	..	?
Nycticorax nycticorax nævius	o	o	o	o	o	o	..	..	..	..	..	o
Pennula ecaudata	†											
Porzanula palmeri	..	..	..	..	..	..	..	o				
Gallinula sandvicensis	o	o	?	o	o	o	o					
Porphyrio melanotis	..	..	..	..	o							
Fulica alai	o	o	?	?	o	o	..					
Phalaropus lobatus	..	..	..	..	o	..	..	..	..	..	..	o
Crymophilus fulicarius	o	o	..	..	..	..	..	o	..	..	..	o
Himantopus knudseni	o	o	o	o	o	o	..					
Gallinago delicata	?											
Tringa acuminata	..	o	..	..	o	..	..	o	..	..	..	o
americana	..	..	..	..	..	..	..	o	..	..	..	o
maculata	o	..	..	..	..	..	..	..	..	..	..	o
Heteractitis incanus	o	o	o	o	o	o	o	o	o	o	o	o
Limosa lapponica baueri	..	o	..	..	..	o	..	o	..	..	..	o
Calidris arenaria	o	o	..	o	o	o						
Numenius tahitiensis	o	o	..	o	o	o	o	o	..	..	o	o
Charadrius dominicus fulvus	o	o	?	o	o	o	o	o	o	o	o	o
Squatarola squatarola	o	..	..	..	..	..	..	..	..	..	..	o
Arenaria interpres	o	o	?	o	o	o	?	o	o	o	o	o
Lophortyx californica	o	o										
Phasianus torquatus	o	o	..	..	o	o						
versicolor	..	..	..	..	o							
Turtur chinensis	o	o	o	..	..	o						
Circus hudsonius	..	..	..	..	o	..	..	..	..	..	..	o
Buteo solitarius	o											
Asio accipitrinus sandvicensis	o	o	o	o	o	o	o					
Alauda arvensis	..	..	..	..	o							
Corvus hawaiiensis	o											
Chasiempis sclateri	..	..	..	..	..	o						
sandvicensis	o											
gayi	..	..	..	..	o							
Acridotheres tristis	o	o	o	o	o	o						
Passer domesticus	o	..	..	..	o							
Carpodacus mexicanus obscurus	o	o	..	o	o							
Munia nisoria	o	o	..	..	o							
Drepanis pacifica	†											
Drepanorhamphus funerea	..	..	..	o								
Vestiaria coccinea	o	o	o	o	o	o						
Palmeria dolei	..	o	..	o								

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TABLE OF DISTRIBUTION.—*Continued.*

NAME.	Hawaii.	Maui.	Lanai.	Molokai.	Oahu.	Kauai.	Niihau.	Laysan.	Lisiansky.	French Frigates.	Midway.	Accidental or wide-ranging.
Himatione sanguinea	o	o	o	o	o	o						
freethi	..	..	..	..	..	..	..	o				
Ciridops anna	†											
Chlorodrepanis stejnegeri	..	..	..	..	..	o						
chloridoides	..	..	o									
wilsoni	..	o										
kalaana	..	..	..	o								
chloris	..	..	..	..	o							
virens	o											
parva	..	..	..	..	..	o						
Viridonia sagittirostris	o											
Oreomyza bairdi	..	..	..	..	..	o						
mana	o											
montana	..	..	o									
maculata	..	..	..	..	o							
newtoni	..	o										
flammea	..	..	..	o								
Loxops coccinea	o											
ochracea	..	o										
rufa	..	..	..	..	†							
cæruleirostris	..	..	..	..	..	o						
Hemignathus lichtensteini	..	..	..	..	†							
obscurus	o											
procerus	..	..	..	..	..	o						
lanaiensis	..	..	o									
Heterorhynchus affinis	..	o										
hanapepe	..	..	..	..	..	o						
lucidus	..	..	..	..	†							
wilsoni	o											
Pseudonestor xanthophrys	..	o										
Psittacirostra olivacea[4]	..	..	..	..	o							
psittacea	o	o	?	o	..	o						
Loxioides bailleui	o											
Telespiza cantans	..	..	..	..	..	..	..	o				
Rhodacanthis palmeri	o											
flaviceps	o											
Chloridops kona	o											
Moho braccatus	..	..	..	..	..	o						
bishopi	..	..	..	o								
nobilis	o											
apicalis	..	..	..	..	†							
Chætoptila angustipluma	†											
Acrocephalus familiaris	..	..	..	..	..	..	..	o				
Phæornis palmeri	..	..	..	..	..	o						
myadestina	..	..	..	..	..	o						
lanaiensis	..	..	o									
obscura	o											
oahuensis	..	..	..	..	†							

[4] The addition of the new Ou to the list brings the total number of species of Hawaiian birds up to 132.

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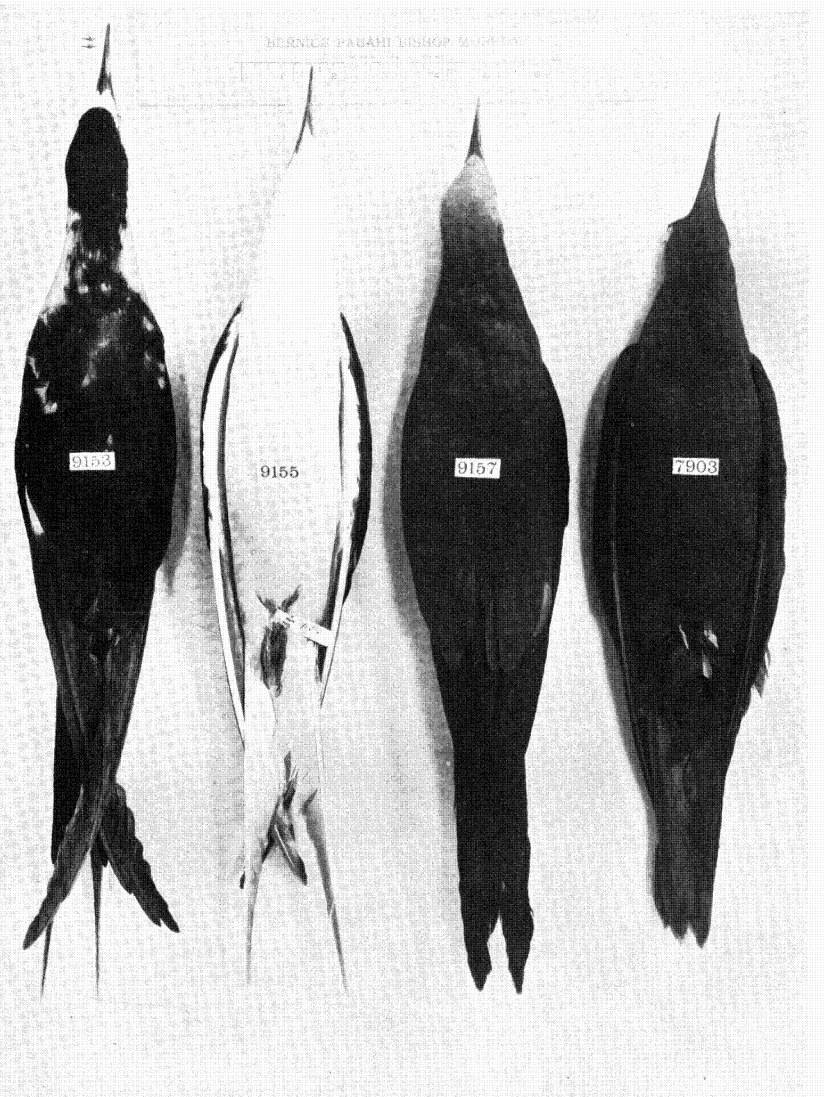

9153, 9155, Sterna fuliginosa. 9157, 7903, Anous stolidus.

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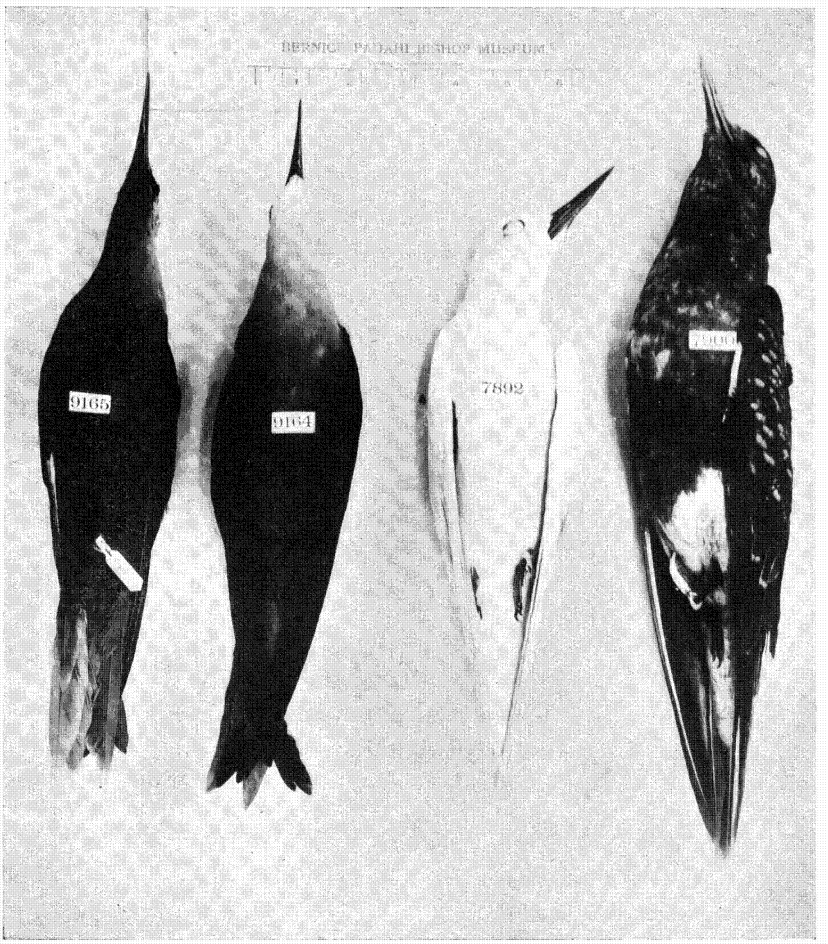

9164, 9165, Microanous hawaiiensis. 7892, Gygis alba kittlitzi. 7966, Anous stolidus.

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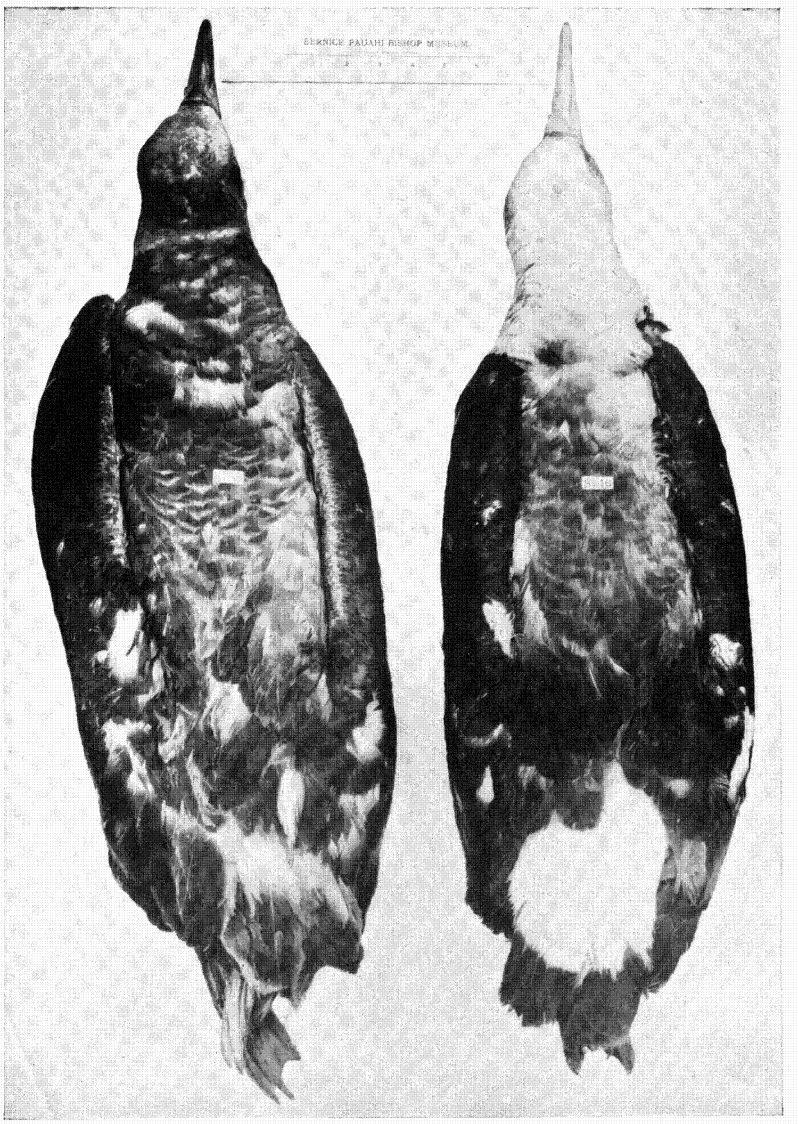

8742, Diomedea nigripes. 8746, Diomedea immutabilis.

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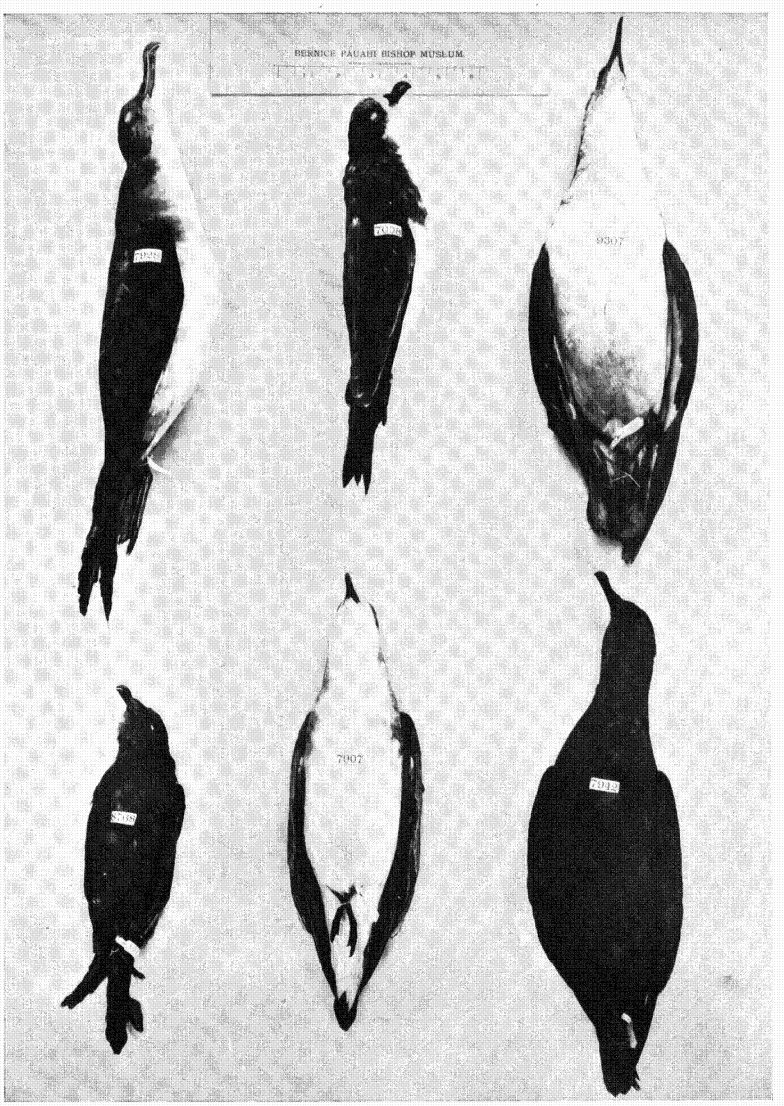

7928, Priofinus cuneatus.
8768, Bulweria bulweri.

7008, 7907, Estrelata hypoleuca.

9307, Puffinus newelli.
7942, Puffinus nativitatis.

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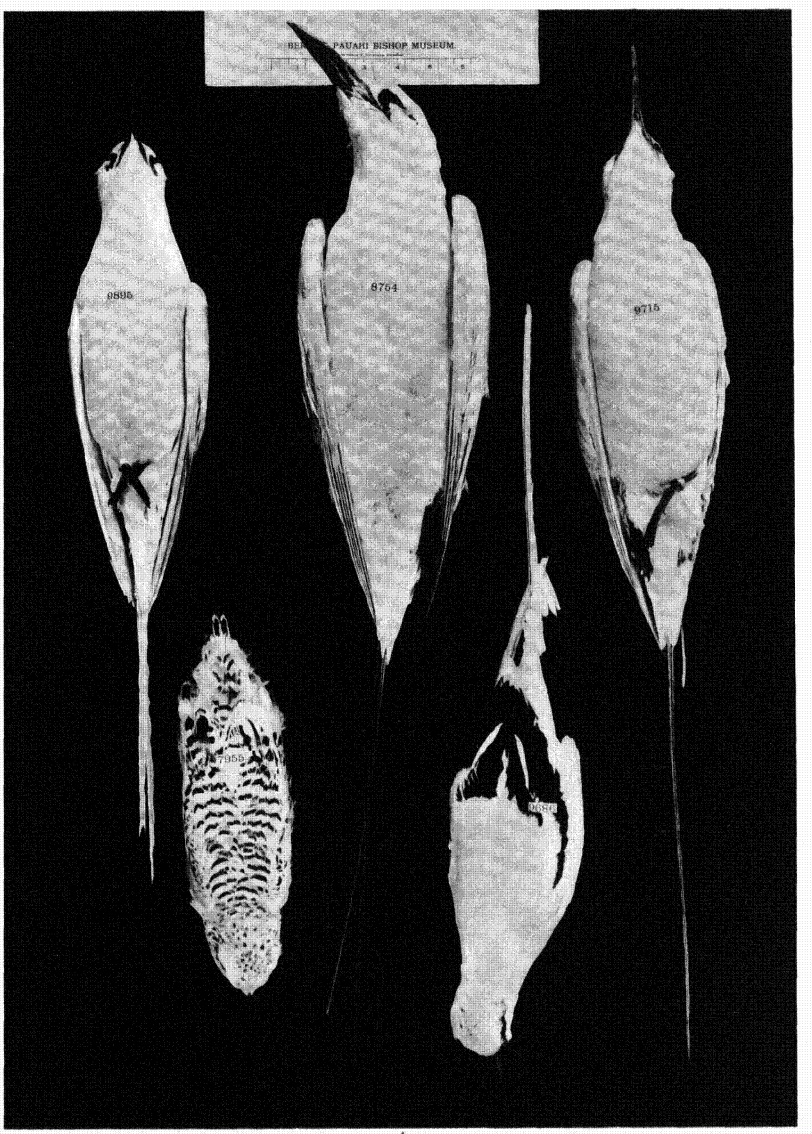

8895, 9896, 7955, Phaëthon lepturus. 8754, 9715, Phaëthon rubricauda.

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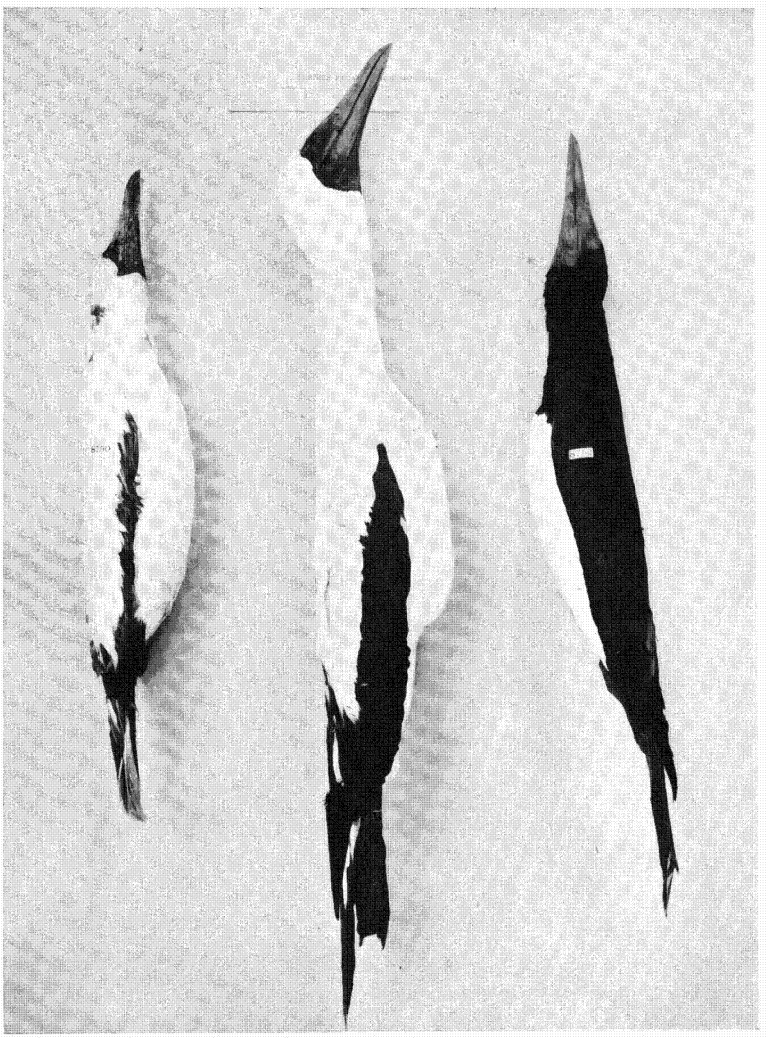

8750, Sula piscator. 7933, Sula cyanops. 8752, Sula sula.

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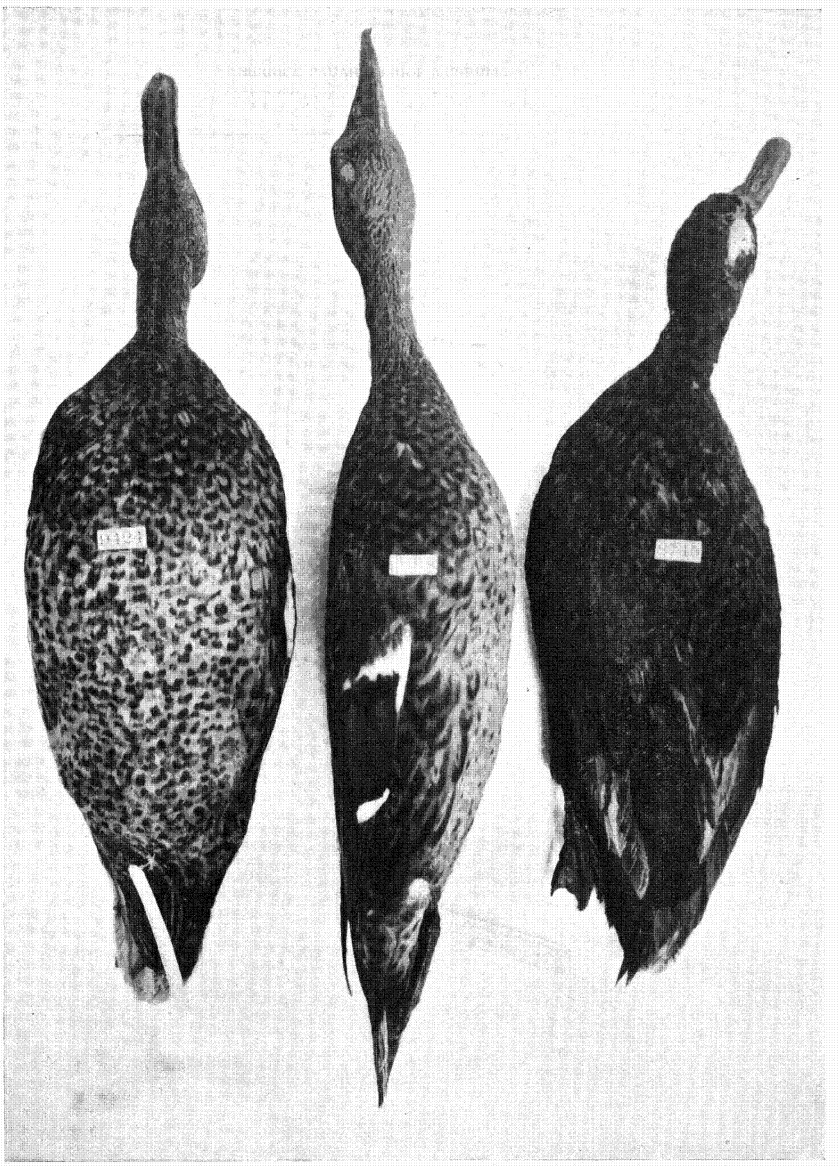

9424, 9168, Anas wyvilliana. 8745, Anas laysanensis.

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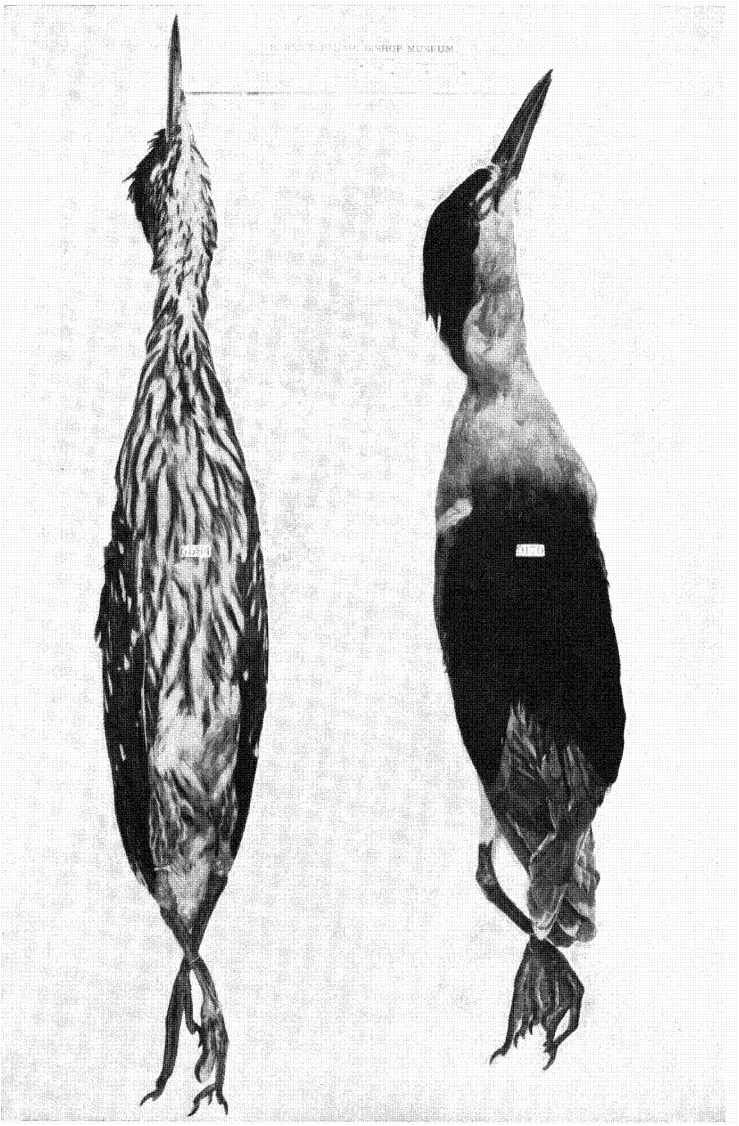

5584(juv.), 9170(♂). Nycticorax nycticorax nævius.

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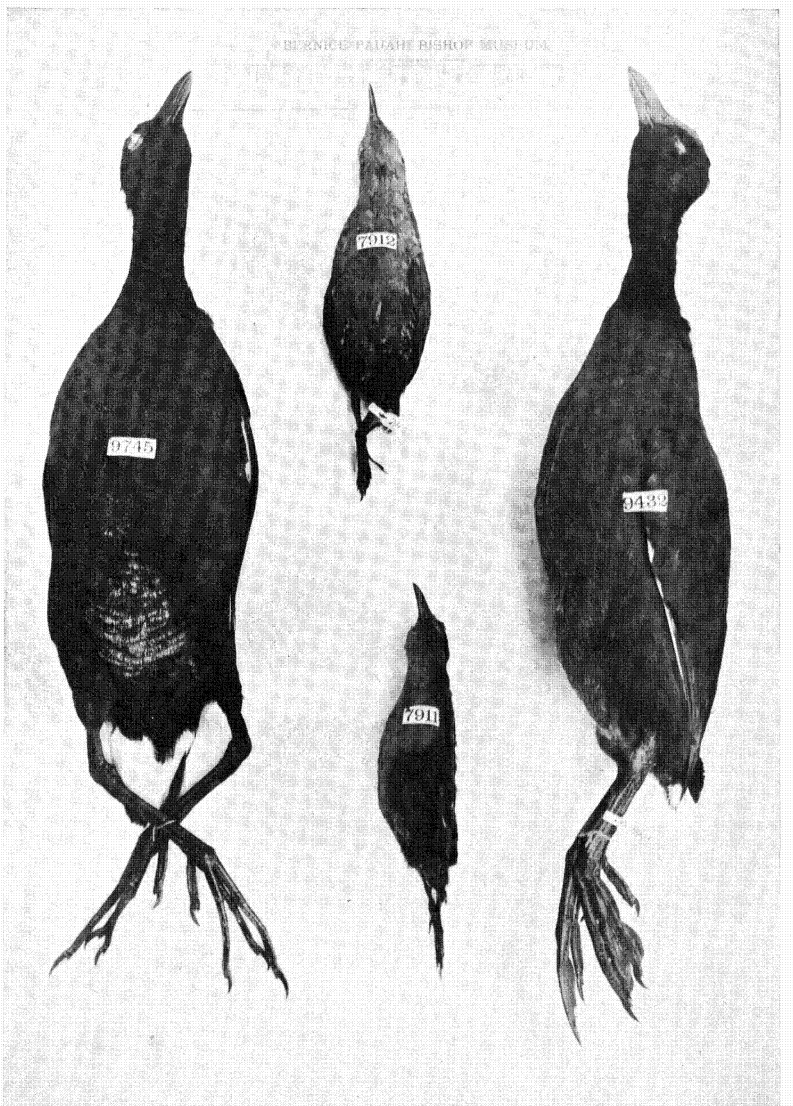

9745, Gallinula sandvicensis. 7911, 7912, Porzanula palmeri. 9432, Fulica alai.

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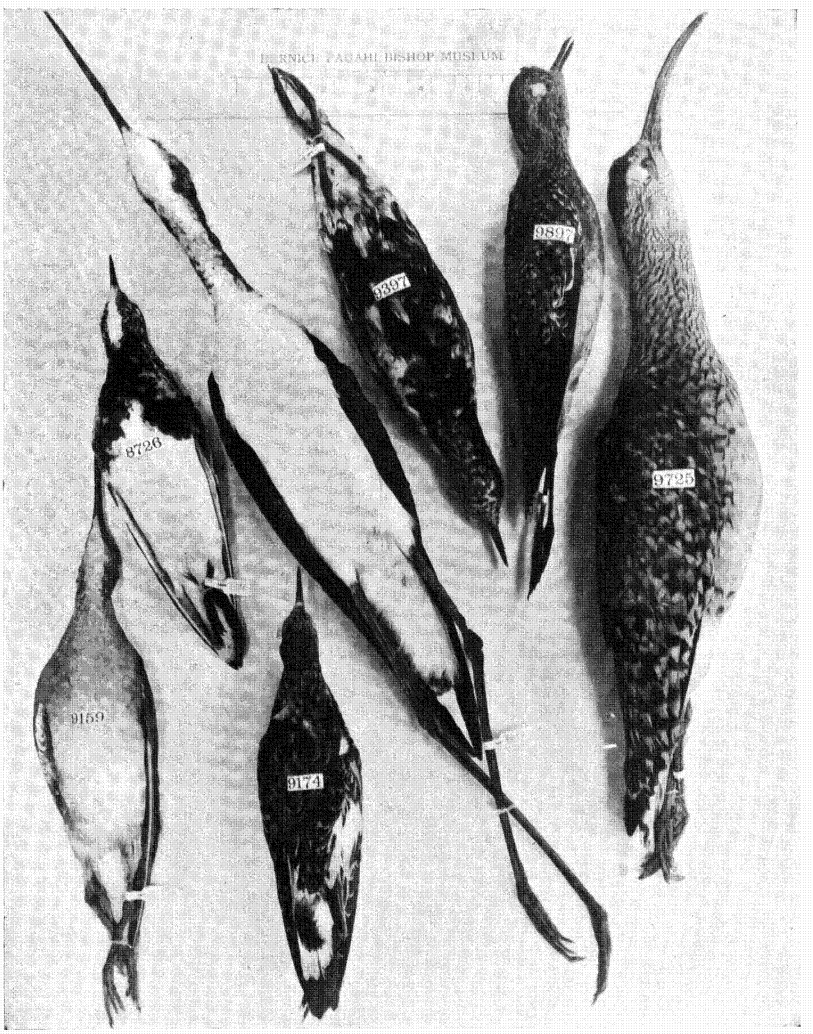

9159, Heteractitis incanus.
8726, 9174, Arenaria interpres.
9397, 9897, Charadrius dominicus fulvus.
9725, Numenius tahitiensis.
9429, Himantopus knudseni.

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5521, Buteo solitarius. 6599, Corvus hawaiiensis. 9835, Asio accipitrinus sandvicensis.

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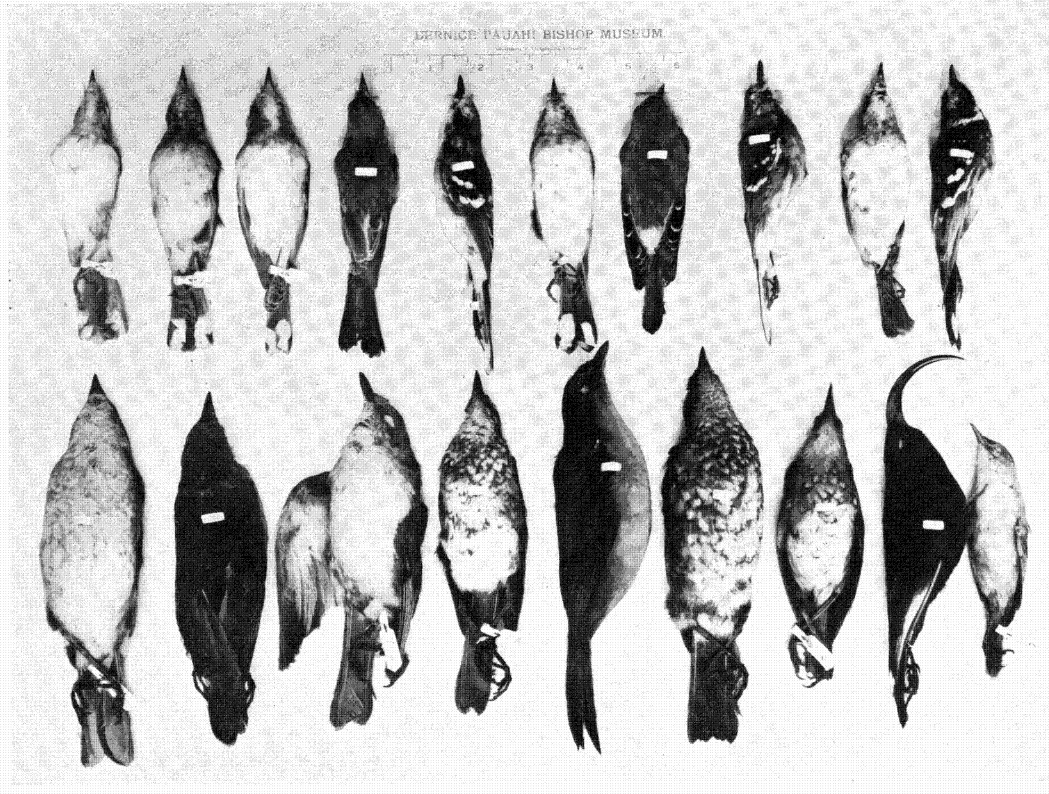

9252, 9258, 9255, 9259, 9260, 9467, Chaslempis gayi; 6657, 9410, C. sclateri; 9923, 9924, C. sandvicensis.
9385, Phaeornis myadestina; 9922, 9923, P. obscura; 6515, 8094, 8096, P. lanaiensis; 6693, P. palmeri.
6696, Drepanorhamphus funerea. 8735, Acrocephalus familiaris.

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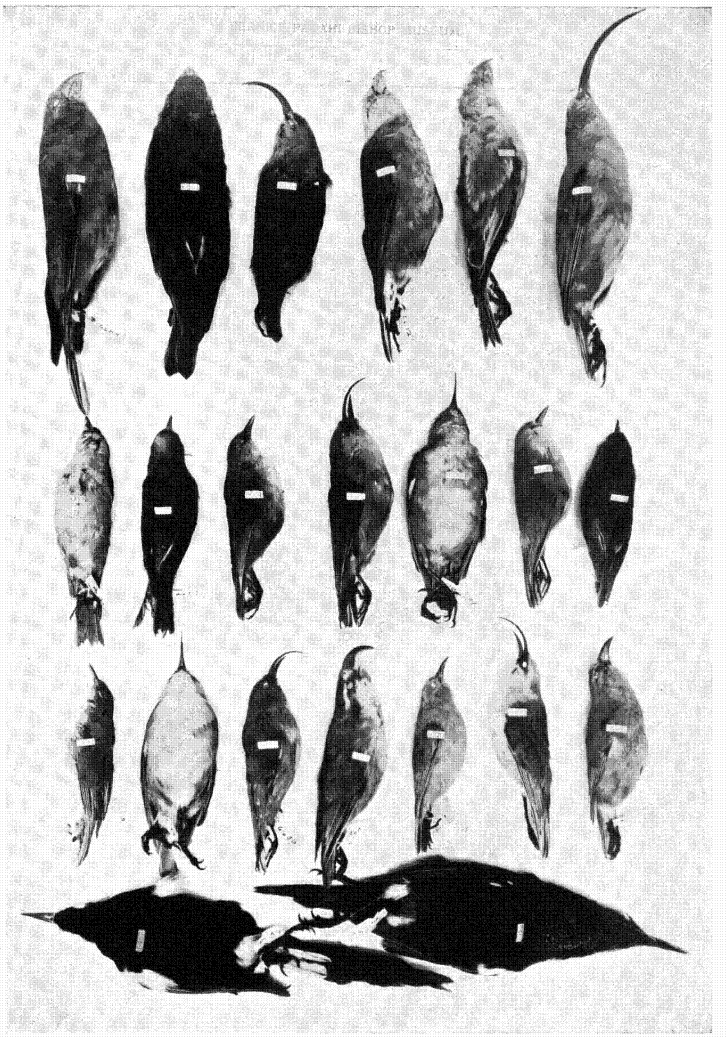

6663, 6661, Rhodocanthis palmeri. 8130, Hemignathus procerus. 6612, Psittacirostris psittacea. 8731, Telespiza cantans.
9421, Hemignathus obscurus.
9353, 9361, Loxops caeruleirostris. 6664, Oreomyza mana. 6652, 6630, Heterorhynchus wilsoni. 6684, 6685, O. newtoni.
9402, Orsomyza bairdi. 6623, 6626, Heterorhynchus hanapepe. 6607, Psendonestor xanthrophrys. 9370, Chlorodrepanis parva.
6620, Heterorhynchus affinis. 9295, C. stejnegeri.
5457, Moho nobilis. 5463, Moho braccatus.

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Chætoptila angustipluma.

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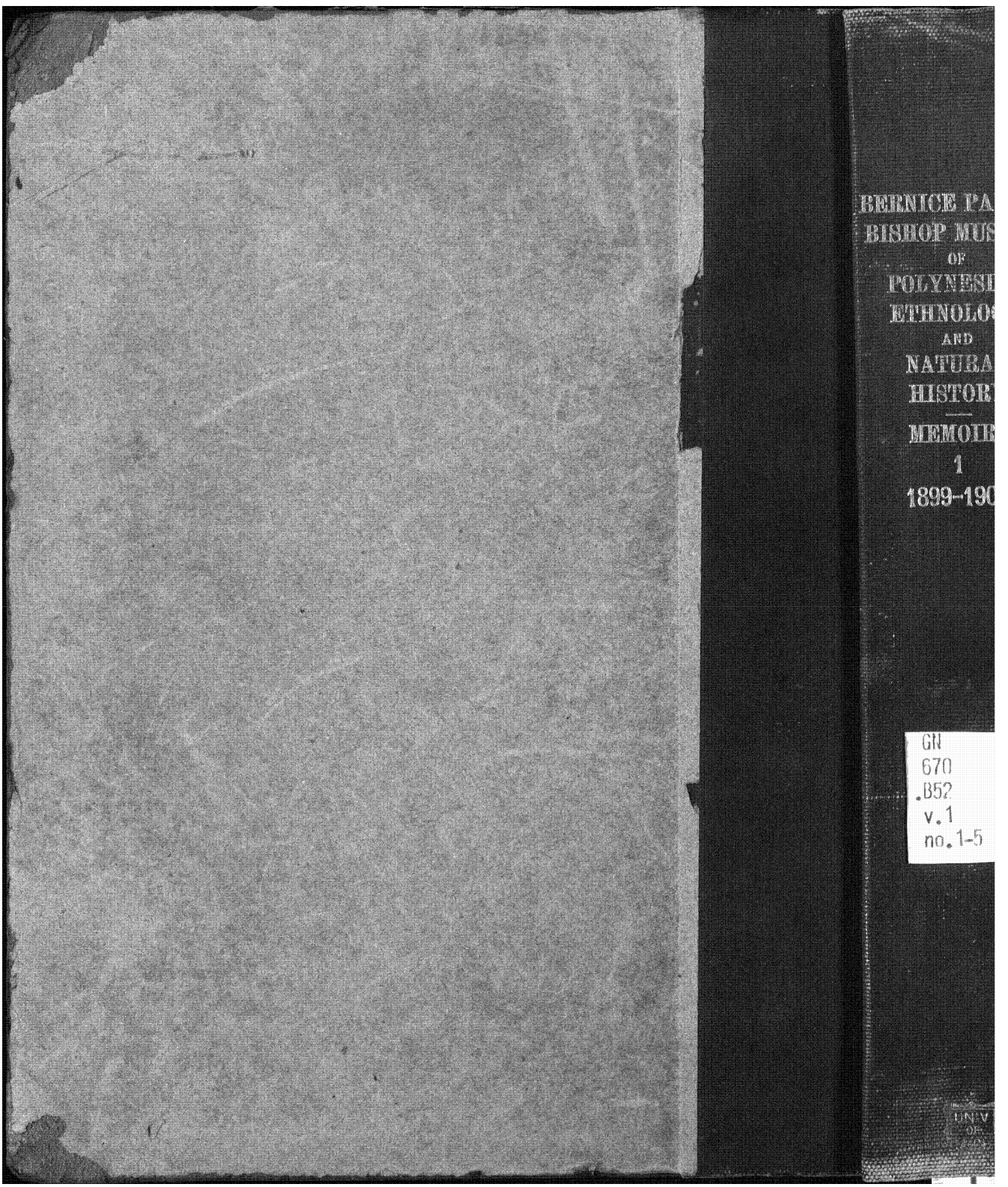

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